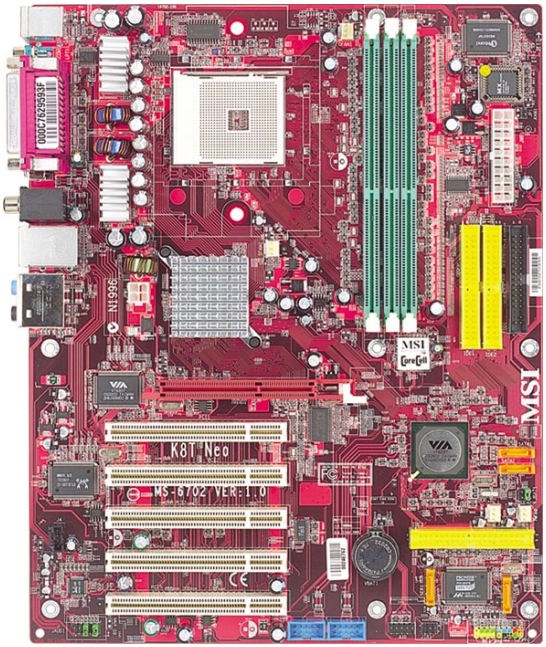
K8T Neo

MS-6702 (v1.X) ATX Mainboard



Version 1.0

G52-M6702X1

Manual Rev: 1.0
Release Date: August 2003

CE N1996

FCC-B Radio Frequency Interference Statement

This equipment has been tested and found to comply with the limits for a class B digital device, pursuant to part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference, in which case the user will be required to correct the interference at his own expense.

Notice 1
The changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

Notice 2
Shielded interface cables and A.C. power cord, if any, must be used in order to comply with the emission limits.

VOIR LA NOTICE D'INSTALLATION AVANT DE RACCORDER AU RESEAU.

Micro-Star International MS-6702

FC **Tested to comply with FCC Standard**

For Home or Office Use

Copyright Notice

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Netware® is a registered trademark of Novell, Inc.
Award® is a registered trademark of Phoenix Technologies Ltd.
AMI® is a registered trademark of American Megatrends Inc.

Revision History

Revision	Revision History	Date
V1.0	First release	August 2003

Technical Support

If a problem arises with your system and no solution can be obtained from the user's manual, please contact your place of purchase or local distributor. Alternatively, please try the following help resources for further guidance.

- Visit the MSI website for FAQ, technical guide, BIOS updates, driver updates, and other information: **http://www.msi.com.tw/**
- Contact our technical staff at: **support@msi.com.tw**

Safety Instructions

1. Always read the safety instructions carefully.
2. Keep this User's Manual for future reference.
3. Keep this equipment away from humidity.
4. Lay this equipment on a reliable flat surface before setting it up.
5. The openings on the enclosure are for air convection hence protects the equipment from overheating. DO NOT COVER THE OPENINGS.
6. Make sure the voltage of the power source and adjust properly 110/220V before connecting the equipment to the power inlet.
7. Place the power cord such a way that people can not step on it. Do not place anything over the power cord.
8. Always Unplug the Power Cord before inserting any add-on card or module.
9. All cautions and warnings on the equipment should be noted.
10. Never pour any liquid into the opening that could damage or cause electrical shock.
11. If any of the following situations arises, get the equipment checked by a service personnel:
    - The power cord or plug is damaged.
    - Liquid has penetrated into the equipment.
    - The equipment has been exposed to moisture.
    - The equipment has not work well or you can not get it work according to User's Manual.
    - The equipment has dropped and damaged.
    - The equipment has obvious sign of breakage.
12. DO NOT LEAVE THIS EQUIPMENT IN AN ENVIRONMENT UNCONDITIONED, STORAGE TEMPERATURE ABOVE 60^0C (140^0F), IT MAY DAMAGE THE EQUIPMENT.

CAUTION: Danger of explosion if battery is incorrectly replaced. Replace only with the same or equivalent type recommended by the manufacturer.

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Getting Started

Thank you for purchasing K8T Neo (MS-6702 v1.X) ATX mainboard. The K8T Neo is based on **VIA® K8T800 North Bridge** & **VT8237 South Bridge** chipsets and provides six USB 2.0 ports for high-speed data transmission, RealTek ALC655 chip for 6-channel audio output, and a SPDIF interface for digital audio transmission. Designed to fit the advanced **AMD® Athlon64** processors, the K8T Neo delivers a high performance and professional desktop platform solution.

Mainboard Specifications

CPU

➤ Supports 64-bit AMD® Athlon64 processor (Socket 754)
➤ Supports up to 3200+, 3400+, or higher CPU

Chipset

➤ VIA® K8T800 chipset
- HyperTransport™ connection to AMD Athlon64 processor
- 8 or 16 bit control/address/data transfer both directions
- 800/600/400/200 MHz "Double Data Rate" operation both direction
- AGP v3.0 compliant with 8x transfer mode

➤ VIA® VT8237 chipset (487 BGA)
- Integrated Faster Ethernet LPC
- Integrated Hardware Sound Blaster/Direct Sound AC97 audio
- Ultra DMA 66/100/133 master mode PCI EIDE controller
- ACPI
- Supports 2 Serial ATA ports
- Supports 8 USB2.0 ports

Main Memory

➤ Supports DDR266/333/400 DDR SDRAM for three 184-pin DDR DIMMs
➤ Supports a maximum memory size of 2GB

Slots

➤ One (Accelerated Graphics Port) AGP slot.
- AGP 3.0 specification compliant

➤Five 32-bit Master 3.3v / 5v PCI Bus slots

On-Board IDE

➤ An IDE controller on the VIA® VT8237 chipset provides IDE HDD/CD-ROM with PIO, Bus Master and Ultra DMA 66/100/133 operation modes
➤ Can connect up to 4 IDE devices
➤ Serial ATA/150 controller integrated by VT8237
- Up ot 150MB/s transfer rate
- Can connect up to 2 serial ATA devices

IEEE 1394 (Optional)

➤ Supports up to 2 * 1394 ports. Transfer rate is up to 400Mbps
➤ Controlled by VIA 6307 chipset

Promise 20378 On-Board (Optional)

➤ Supports 2 serial ATA plus 1 ATA133
- RAID 0, RAID 1 or RAID 0+1 is supported
- RAID function work w/ATA133+SATA H/D or 2SATA H/D

➤ Connect up to 2 SATA device and 2 ATA133 devices

On-Board Peripherals

➤ On-Board Peripherals include:
- 1 floppy port supports 2 FDDs with 360K, 720K, 1.2M, 1.44M and 2.88Mbytes
- 1 serial ports (COMA)
- 1 parallel port supports SPP/EPP/ECP mode
- 1 IrDA connector for SIR/ASKIR/HPSIR
- 1 audio port
- 1 D-Bracket2 pinheader

Audio

➤ 6 channels software audio codec RealTek ALC655.
- Compliance with AC97 v2.3 Spec.
- Meet PC2001 audio performance requirement.

LAN 10/100/1000MBps

➤ Realtek® 8110C/8110S Dual layout.
- Integrated Fast Ethernet MAC and PHY in one chip.
- Supports 10Mb/s, 100Mb/s and 1000Mb/s (1000Mb/s only for Realtek 8110S)

BIOS

➤ The mainboard BIOS provides “Plug & Play” BIOS which detects the peripheral devices and expansion cards of the board automatically.

➤ The mainboard provides a Desktop Management Interface (DMI) function which records your mainboard specifications.

➤ ACPI, 1.0a, APM1.2, PnP 1.0a, SMBIOS 2.3, USB 2.0, WFM 2.0, Overclock, Boot from USB device.

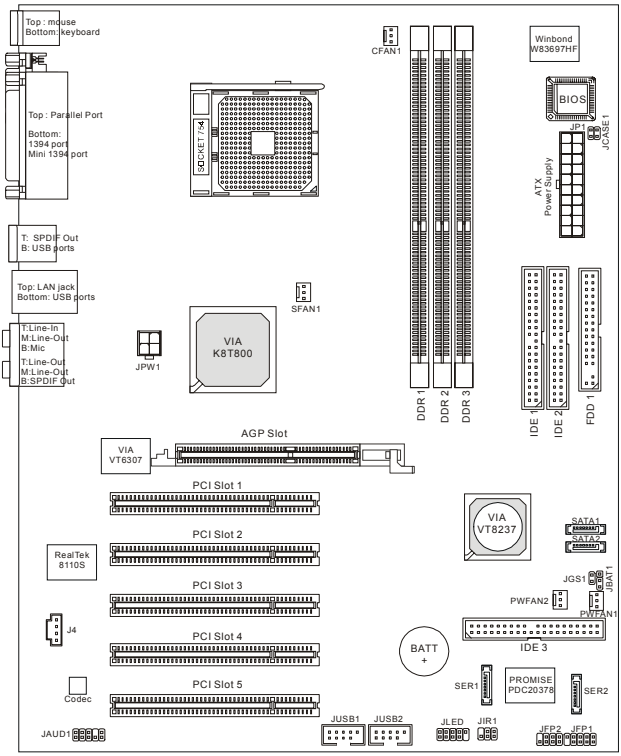
Dimension

➤ ATX Form Factor: 30.5 cm (L) x 24.5 cm (W).

Mounting

➤ 9 mounting holes.

Mainboard Layout



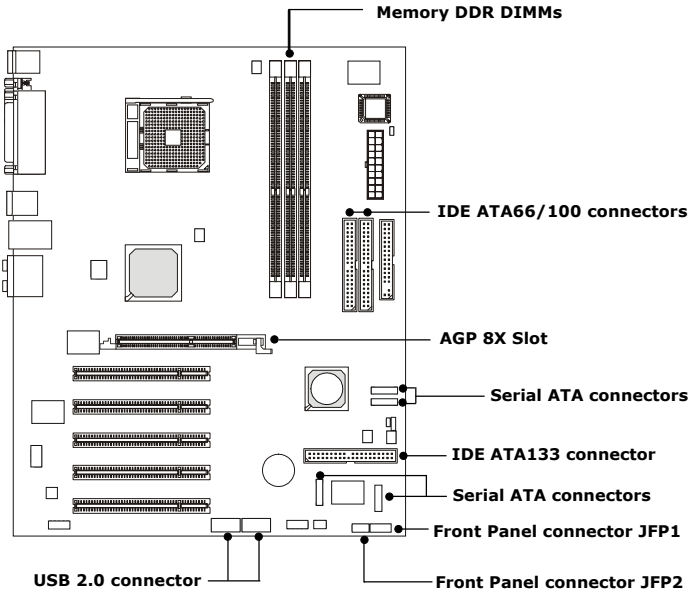
MS-6702 v1.X ATX Mainboard

MSI Special Features

Color Management

MSI has a unified color management rule for some connectors on the mainboards, which helps you to install the memory modules, expansion cards and other peripherals devices more easily and conveniently.

- Memory DDR DIMMs: Light Green
- Intel spec IDE ATA66/100 connector: Yellow
- IDE ATA133 connector: Yellow
- Serial ATA connectors: Orange
- AGP 8X slot: Red
- USB 2.0 connector: Blue
- Front panel connector JFP1 : HDD LED in Red, Reset Switch in Blue, Power Switch in Black, Power LED in Light Green.
- Front panel connector JFP2: Power LED in Light Green.



Core Center

The Core Center is a new utility you can find in the CD-ROM disk. The utility is just like your PC doctor that can detect, view and adjust the PC hardware and system status during real time operation.

Cool'n'Quiet

This utility provides a CPU temperature detecting function called Cool'n'Quiet. Cool'n'Quiet is a special feature designed only for AMD® Athlon64 processor, and with Cool'n'Quiet, the system will be capable of detecting the temperature of the CPU according to the CPU's working loading . When the CPU temperature climbs up to a certain degree, the speed of the system cooling fan will be risen automatically, and on the other hand, the speed of the system cooling fan will dorp instantly when the CPU temperature descends to its normal degree.

To activate Cool'n'Quiet function, please click the Core Center Cool'n'Quiet icon, and then select Cool'n'Quiet mode. If User mode is selected, you will be able to adjust the CPU fan speed by sliding the adjusting bar.

In addition to Cool'n'Quiet setting, the current system status (including Vcore, 3.3V, +5V and 12V) and the current PC hardware status (such as the CPU & system temperatures and all fans speeds) are also shown on the left and right sides.

When you click the red triangles in the left and right sides, two sub-menus will open for users to overclock, overspec or to adjust the thresholds of system to send out the warning messages.

Left-side: Current system status

In the left sub-menu, you can configure the settings of FSB, Vcore, Memory Voltage and AGP Voltage by clicking the radio button in front of each item and make it available (the radio button will be lighted as yellow when selected), use the "+" and "**-**" buttons to adjust, then click ***OK*** to apply the changes. Then you can click ***Save*** to save the desired FSB you just configured.

Also you may click ***Auto*** to start testing the maximal CPU overclocking value, The CPU FSB will automatically increase the testing value until the PC reboots. Or you may click ***Default*** to restore the default values.

Right-side: PC hardware status during real time operation

In the right sub-menu, here you can configure the PC hardware status such as CPU & system temperatures and fan speeds. You may use the scroll bars to adjust each item, then click "***OK***" to apply the changes. The values you set for the temperatures are the maximum thresholds for the system for warnings, and the values for fan speeds are the minimum thresholds.

Core Cell™ Chip

By diagnosing the current system utilization, the CoreCell™ Chip automatically tunes your motherboard to the optimal state, leading to less noise, longer duration, more power-saving and higher performance.

Features of CoreCell™

Speedster

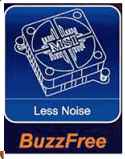
-- Advanced O.C. design.
-- Superior O.C. capability.
-- Greater O.C. method.

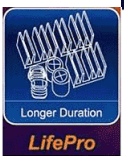
PowerPro

-- Saves up to 65% power.
-- Assures motherboard stability.
-- Empowers O.C Capability.

BuzzFree

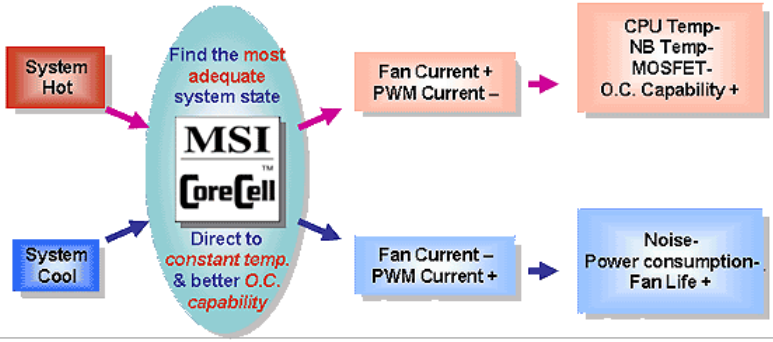
-- Diagnoses current system utilization & temperature.
-- Controls both CPU and NorthBridge fans.
-- Cuts up to 50% of system noise.





LifePro

-- Prolongs motherboard, CPU and fan life.
-- Maintains motherboard & CPU in constant temperature.
-- Prevents components from operating beyond specifications.


System Hot
System Cool
Find the most adequate system state
MSI
CoreCell
Direct to constant temp. & better O.C. capability
Fan Current + PWM Current –
Fan Current – PWM Current +
CPU Temp- NB Temp- MOSFET- O.C. Capability +
Noise- Power consumption- Fan Life +

Dynamic Overclocking Technology

Dynamic Overclocking Technology is the automatic overclocking function. It is designed to detect the load balance of CPU while running programs, and to adjust the best CPU frequency automatically. When the motherboard detects CPU is running programs, it will speed up CPU automatically to make the program run smoothly and faster. When the CPU is temporarily suspending or staying in the low load balance, it will restore the default settings instead. Usually the Dynamic Overclocking Technology will be powered only when users' PC need to run huge amount of data like 3D games or the video process, and the CPU frequency need to be boosted up to enhance the overall performance.

D.O.T

Dynamic Overclocking Technology

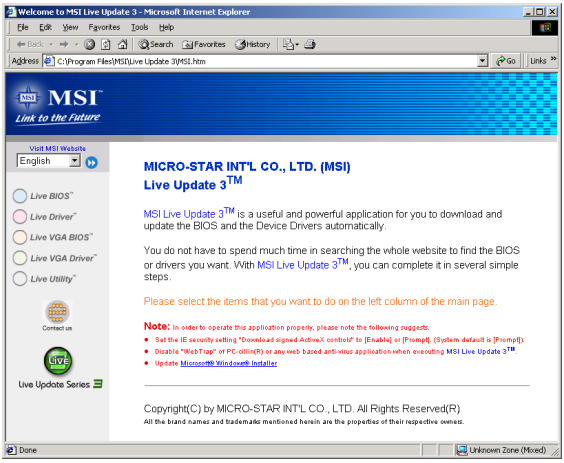
MSI Reminds You...

Even though the Dynamic Overclocking Technology is more stable than manual overclocking, basically, it is still risky. We suggest user to make sure that your CPU can afford to overclocking regularly first. If you find the PC appears to be unstable or reboot incidentally, it's better to disable the Dynamic Overclocking or to lower the level of overclocking options. By the way, if you need to conduct overclocking manually, you also need to disable the Dynamic OverClocking first.

Live BIOS™/Live Driver™

The Live BIOS™/Live Driver™ is a tool used to detect and update your BIOS/drivers online so that you don't need to search for the correct BIOS/driver version throughout the whole Web site. To use the function, you need to install the "MSI Live Update 3" application. After the installation, the "MSI Live Update 3" icon (as shown on the right) will appear on the screen.

Double click the "MSI Live Update Series 3" icon, and the following screen will appear:


Welcome to MSI Live Update 3 - Microsoft Internet Explorer
MSI
Link to the Future
Visit MSI Website
English
Live BIOS
Live Driver
Live VGA BIOS
Live VGA Driver
Live Utility
Contact us
Live Update Series
MICRO-STAR INT'L CO., LTD. (MSI)
Live Update 3™
MSI Live Update 3™ is a useful and powerful application for you to download and update the BIOS and the Device Drivers automatically.
You do not have to spend much time in searching the whole website to find the BIOS or drivers you want. With MSI Live Update 3™, you can complete it in several simple steps.
Please select the items that you want to do on the left column of the main page.
Note: In order to operate this application properly, please note the following suggests.
Copyright(C) by MICRO-STAR INT'L CO., LTD. All Rights Reserved(R)
All the brand names and trademarks mentioned herein are the properties of their respective owners.
Done
Unknown Zone (Mixed)

Five buttons are placed on the left column of the screen. Click the desired button to start the update process.

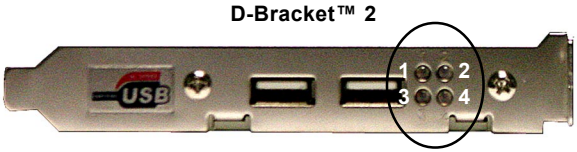
- **Live BIOS** – Updates the BIOS online.
- **Live Driver** – Updates the drivers online.
- **Live VGA BIOS** – Updates the VGA BIOS online.
- **Live VGA Driver** – Updates the VGA driver online.
- **Live Utility** – Updates the utilities online.

If the product you purchased does not support any of the functions listed above, a "sorry" message is displayed. For more information on the update instructions, insert the companion CD and refer to the "Live Update Guide" under the "Manual" Tab.

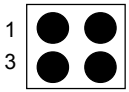
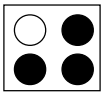
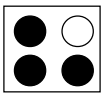
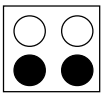
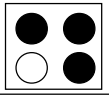
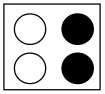
D-Bracket™ 2 (Optional)

D-Bracket™ 2 is an external USB bracket integrating four Diagnostic LEDs, which use graphic signal display to help users understand their system. The LEDs provide up to 16 combinations of signals to debug the system. The 4 LEDs can debug all problems that fail the system, such as VGA, RAM or other failures. This special feature is very useful for the overclocking users. These users can use the feature to detect if there are any problems or failures.

D-Bracket™ 2 supports both USB 1.1 & 2.0 specification.



● **Red** ○ **Green**

D-Bracket™ 2	Description
	System Power ON - The D-LED will hang here if the processor is damaged or not installed properly.
	Early Chipset Initialization
	Memory Detection Test - Testing onboard memory size. The D-LED will hang if the memory module is damaged or not installed properly.
	Decompressing BIOS image to RAM for fast booting.
	Initializing Keyboard Controller.
	Testing VGA BIOS - This will start writing VGA sign-on message to the screen.

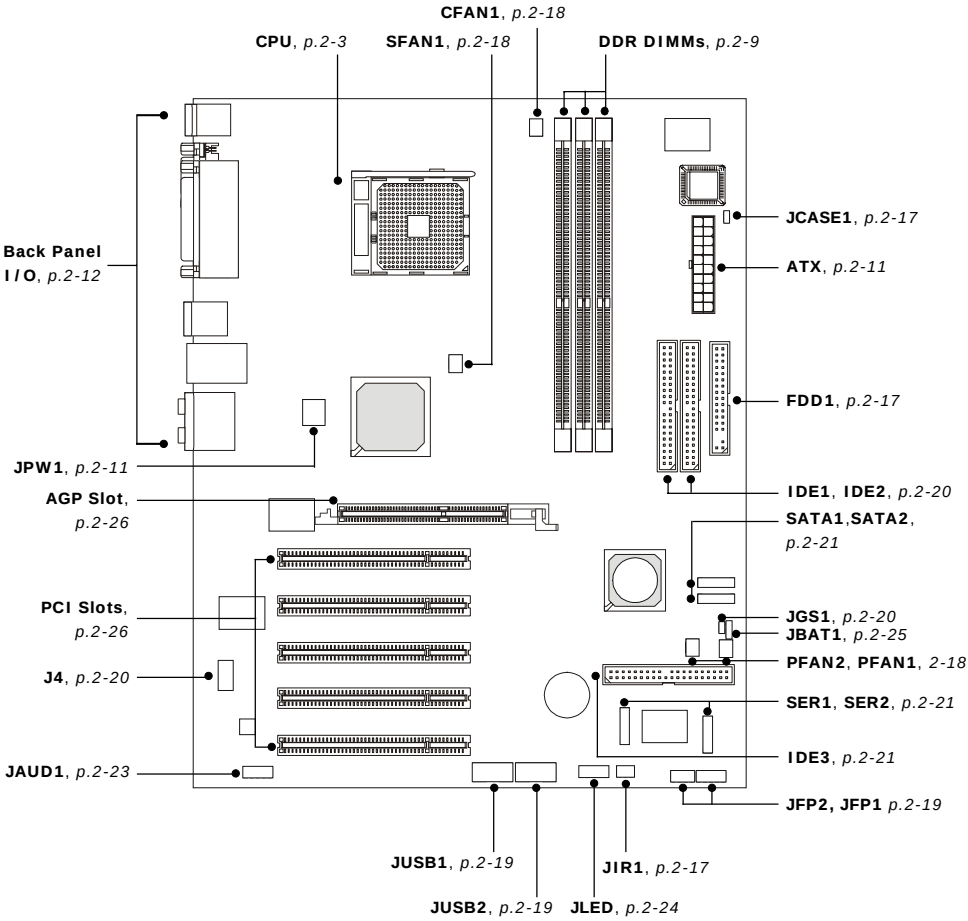
D-Bracket™ 2	Description
	Processor Initialization - This will show information regarding the processor (like brand name, system bus, etc…)
	Testing RTC (Real Time Clock)
	Initializing Video Interface - This will start detecting CPU clock, checking type of video onboard. Then, detect and initialize the video adapter.
	BIOS Sign On - This will start showing information about logo, processor brand name, etc….
	Testing Base and Extended Memory - Testing base memory from 240K to 640K and extended memory above 1MB using various patterns.
	Assign Resources to all ISA.
	Initializing Hard Drive Controller - This will initialize IDE drive and controller.
	Initializing Floppy Drive Controller - This will initializing Floppy Drive and controller.
	Boot Attempt - This will set low stack and boot via INT 19h.
	Operating System Booting

Hardware Setup

This chapter tells you how to install the CPU, memory modules, and expansion cards, as well as how to setup the jumpers on the mainboard. Also, it provides the instructions on connecting the peripheral devices, such as the mouse, keyboard, etc.

While doing the installation, be careful in holding the components and follow the installation procedures.

Quick Components Guide



Central Processing Unit: CPU

The mainboard supports AMD® Athlon64 processor. The mainboard uses a CPU socket called Socket-754 for easy CPU installation. When you are installing the CPU, **make sure the CPU has a heat sink and a cooling fan attached on the top to prevent overheating.** If you do not have the heat sink and cooling fan, contact your dealer to purchase and install them before turning on the computer.

Memory Speed/CPU FSB Support Matrix

	DDR 266	DDR 333	DDR 400
DIMM1	OK	OK	OK
DIMM2	OK	OK	OK
DIMM3	OK	OK	OK*

Note: Plugging memories in DIMM1 and DIMM2 can maximize the system performance.

**Please Refer to the list of supported memory for 3 DIMM/DDR400 at MSI website.*

MSI Reminds You...

Overheating

Overheating will seriously damage the CPU and system, always make sure the cooling fan can work properly to protect the CPU from overheating.

Replacing the CPU

While replacing the CPU, always turn off the ATX power supply or unplug the power supply's power cord from grounded outlet first to ensure the safety of CPU.

Overclocking

This motherboard is designed to support overclocking. However, please make sure your components are able to tolerate such abnormal setting, while doing overclocking. Any attempt to operate beyond product specifications is not recommended. ***We do not guarantee the damages or risks caused by inadequate operation or beyond product specifications.***

CPU Installation Procedures for Socket 754

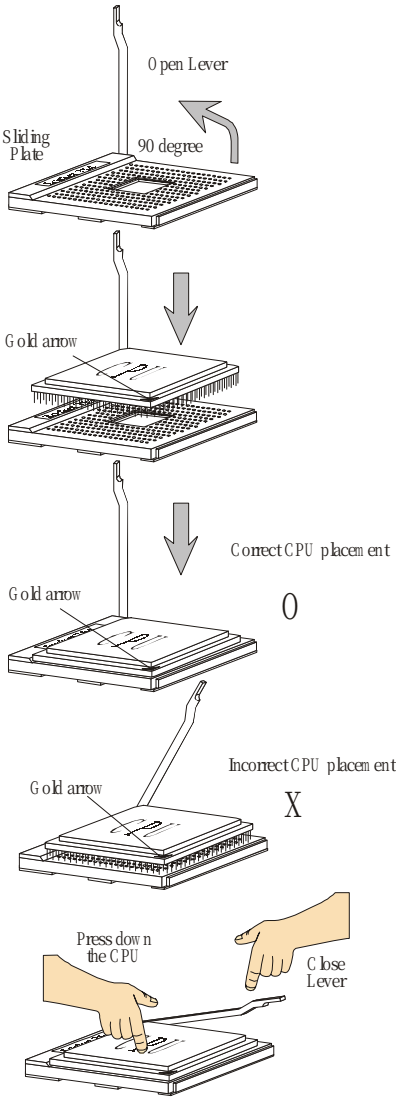
1. Please turn off the power and unplug the power cord before installing the CPU.

2. Pull the lever sideways away from the socket. Make sure to raise the lever up to a 90-degree angle.

3. Look for the gold arrow. The gold arrow should point towards the lever pivot. The CPU can only fit in the correct orientation.

4. If the CPU is correctly installed, the pins should be completely embedded into the socket and can not be seen. Please note that any violation of the correct installation procedures may cause permanent damages to your mainboard.

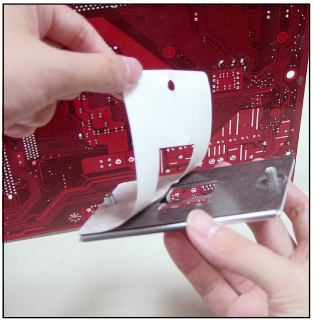
5. Press the CPU down firmly into the socket and close the lever. As the CPU is likely to move while the lever is being closed, always close the lever with your fingers pressing tightly on top of the CPU to make sure the CPU is properly and completely embedded into the socket.



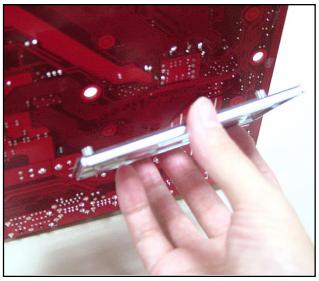
Installing AMD Athlon64 CPU Cooler Set

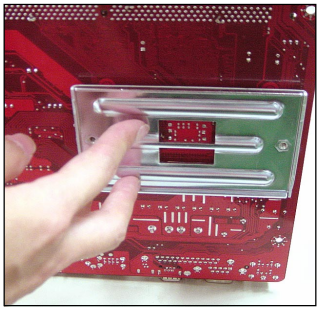
When you are installing the CPU, ***make sure the CPU has a heat sink and a cooling fan attached on the top to prevent overheating.*** *If you do not have the heat sink and cooling fan, contact your dealer to purchase and install them before turning on the computer.*

1. Detach the shield of the backplate's paster.



2. Turn over the mainboard, and install the backplate to the proper position.

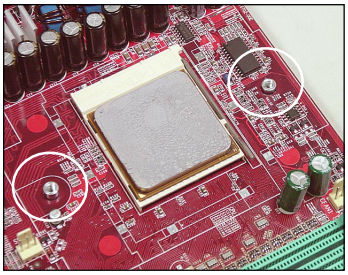




3. Turn over the mainboard again, and place the mainboard on the flat surface.

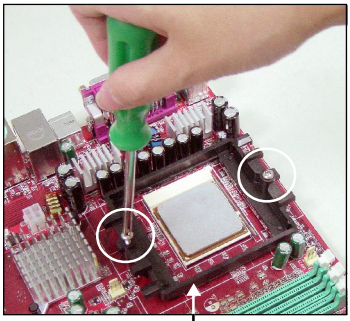
   Locate the two screw holes of the backplate.

   Properly place the CPU onto the CPU socket .



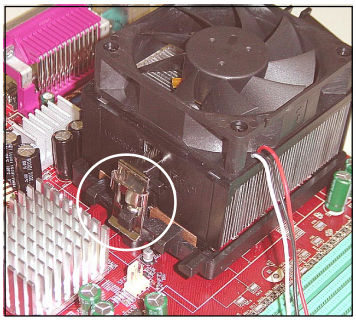
4. Align the retention mechanism and the backplate.

   Fix the retention mechanism and the backplate with two screws.

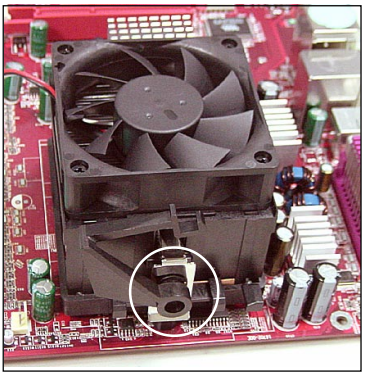


5. Position the cooling set onto the retention mechanism.

   Hook one end of the clip to hook first.

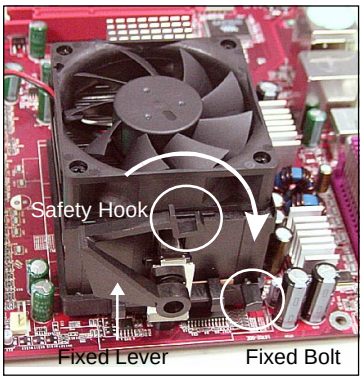


6. Press down the other end of the clip to fasten the cooling set on the top of the retention mechanism.

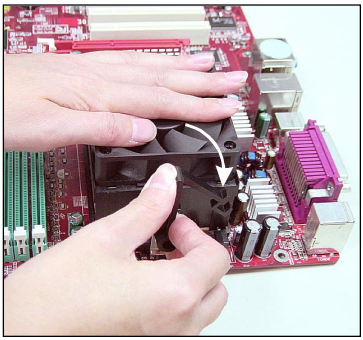


7. Locate the Fix Lever, Saftey Hook and the Fixed Bolt.

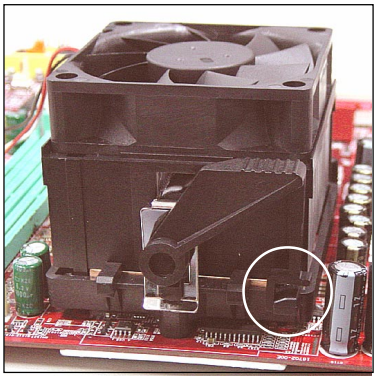
   Lift up the intensive fixed lever.



8. Fastened down the lever.



9. Make sure the safety hook completely clasps the fixed bolt of the retention mechanism.



MSI Reminds You...

While disconnecting the Safety Hook from the fixed bolt, it is necessary to keep an eye on your fingers, because once the Safety Hook is disconnected from the fixed bolt, the fixed lever will spring back instantly.

Memory

The mainboard provides 3 slots for 184-pin DDR SDRAM DIMM (Double In-Line Memory Module) modules and supports the memory size up to 2GB. You can install PC3200/DDR400, PC2700/DDR333, PC2100/DDR266 or PC1600/DDR200 unbuffered DIMM modules on the DDR DIMM slots (DDR 1~3). **Plugging memories in DIMM1 and DIMM2 makes the system reach the optimum system performance.**

DDR DIMM Slots (DDR 1~3)

Introduction to DDR SDRAM

DDR (Double Data Rate) SDRAM is similar to conventional SDRAM, but doubles the rate by transferring data twice per cycle. It uses 2.5 volts as opposed to 3.3 volts used in SDR SDRAM, and requires 184-pin DIMM modules rather than 168-pin DIMM modules used by SDR SDRAM. High memory bandwidth makes DDR an ideal solution for high performance PC, workstations and servers.

DDR DIMM Module Combination

Install at least one DIMM module on the slots. Memory modules can be installed on the slots in any order. You can install either single- or double-sided modules to meet your own needs.

Memory modules can be installed in any combination as follows:

Slot	Memory Module
DIMM 1 (Bank 0 & 1) DIMM 2 (Bank 2 & 3) DIMM 3 (Bank 4 & 5)	S/D S/D S/D
Maximum System Memory Supported	**64MB~2GB**

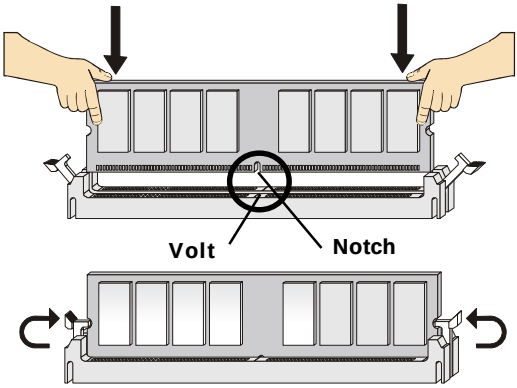
S: Single Side **D: Double Side**

Installing DDR Modules

1. The DDR DIMM has only one notch on the center of module. The module will only fit in the right orientation.
2. Insert the DIMM memory module vertically into the DIMM slot. Then push it in until the golden finger of the memory module is deeply inserted in the socket.

MSI Reminds You...
You can barely see the golden finger if the module is properly inserted in the socket.

3. The plastic clip at each side of the DIMM slot will automatically close.

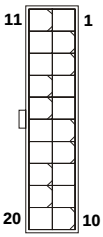


Power Supply

The mainboard supports ATX power supply for the power system. Before inserting the power supply connector, always make sure that all components are installed properly to ensure that no damage will be caused.

ATX 20-Pin Power Connector: ATX

This connector allows you to connect to an ATX power supply. To connect to the ATX power supply, make sure the plug of the power supply is inserted in the proper orientation and the pins are aligned. Then push down the power supply firmly into the connector.



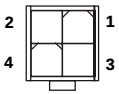
ATX

ATX Pin Definition

PIN	SIGNAL	PIN	SIGNAL
1	3.3V	11	3.3V
2	3.3V	12	-12V
3	GND	13	GND
4	5V	14	PS_ON
5	GND	15	GND
6	5V	16	GND
7	GND	17	GND
8	PW_OK	18	-5V
9	5V_SB	19	5V
10	12V	20	5V

ATX 12V Power Connector: JPW1

This 12V power connector is used to provide power to the CPU.



JPW1

JPW1 Pin Definition

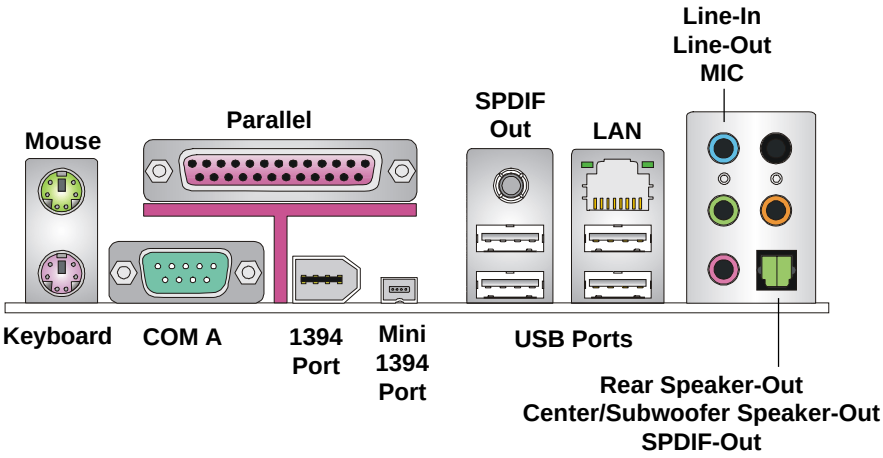
PIN	SIGNAL
1	GND
2	GND
3	12V
4	12V

MSI Reminds You...

Power supply of 300 (and up) watt is highly recommended for system stability.

Back Panel

The back panel provides the following connectors:

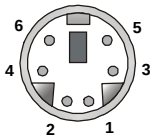


Mouse Connector

The mainboard provides a standard PS/2® mouse mini DIN connector for attaching a PS/2® mouse. You can plug a PS/2® mouse directly into this connector.

Keyboard Connector

The mainboard provides a standard PS/2® keyboard mini DIN connector for attaching a PS/2® keyboard. You can plug a PS/2® keyboard directly into this connector.



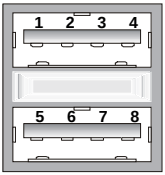
PS/2 Mouse (6-pin Female)
PS/2 Keyboard (6-pin Female)

Pin Definition

PIN	SIGNAL	DESCRIPTION
1	Mouse DATA (or Keyboard DATA)	Mouse DATA (or Keyboard DATA)
2	NC	No connection
3	GND	Ground
4	VCC	+5V
5	Mouse Clock (or Keyboard Clock)	Mouse clock (or Keyboard Clock)
6	NC	No connection

USB 2.0 Connectors

The mainboard provides a UHCI (Universal Host Controller Interface) Universal Serial Bus root for attaching USB devices such as keyboard, mouse or other USB-compatible devices. You can plug the USB device directly into the connector.



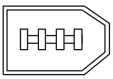
USB Ports

USB Port Description

PIN	SIGNAL	DESCRIPTION
1	VCC	+5V
2	-Data 0	Negative Data Channel 0
3	+Data0	Positive Data Channel 0
4	GND	Ground
5	VCC	+5V
6	-Data 1	Negative Data Channel 1
7	+Data 1	Positive Data Channel 1
8	GND	Ground

IEEE1394 Ports (Optional)

The mainboard provides two IEEE 1394 ports. The mini IEEE1394 port is designed for you to connect the IEEE1394 device with external power. The standard IEEE1394 port connects to IEEE1394 devices without external power. The IEEE1394 high-speed serial bus components provide the enhanced PC connectivity for a wide range of devices, including consumer electronics audio/video (A/V) appliances, storage peripherals, other PCs, and portable devices.

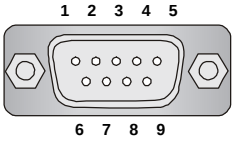


IEEE1394 Port (Standard)

IEEE1394 Port (Mini)

Serial Port Connectors: COM A

The mainboard offers one 9-pin male DIN connectors as serial port COM A. The ports are 16550A high speed communication ports that send/receive 16 bytes FIFOs. You can attach a serial mouse or other serial devices directly to the connectors.



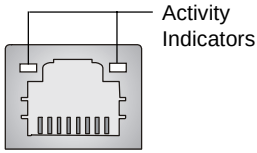
9-Pin Male DIN Connector

Pin Definition

PIN	SIGNAL	DESCRIPTION
1	DCD	Data Carry Detect
2	SIN	Serial In or Receive Data
3	SOUT	Serial Out or Transmit Data
4	DTR	Data Terminal Ready)
5	GND	Ground
6	DSR	Data Set Ready
7	RTS	Request To Send
8	CTS	Clear To Send
9	RI	Ring Indicate

RJ-45 LAN Jack (Optional)

The mainboard provides one standard RJ-45 jack for connection to Local Area Network (LAN). You can connect a network cable to the LAN jack.



RJ-45 LAN Jack

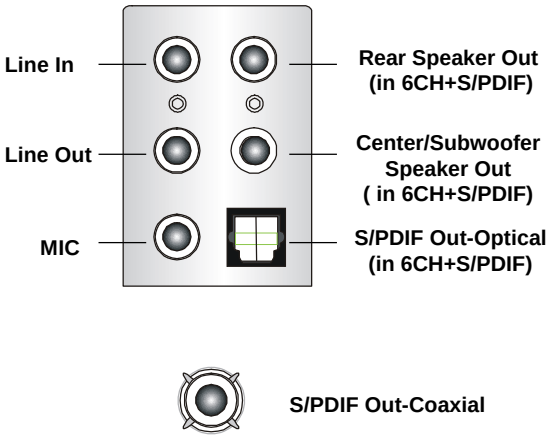
Pin Definition

PIN	SIGNAL	DESCRIPTION
1	TDP	Transmit Differential Pair
2	TDN	Transmit Differential Pair
3	RDP	Receive Differential Pair
4	NC	Not Used
5	NC	Not Used
6	RDN	Receive Differential Pair
7	NC	Not Used
8	NC	Not Used

Audio Port Connectors

The left 3 audio jacks are for 2-channel mode for stereo speaker output: **Line Out** is a connector for Speakers or Headphones. **Line In** is used for external CD player, Tape player, or other audio devices. **Mic** is a connector for microphones.

However, there is an advanced audio application provided by Realtek ALC655 to offer support for **6-channel audio operation** and can turn rear audio connectors from 2-channel to 4-/6-channel audio. For more information on **6-channel audio operation**, please refer to *Appendix A: Using 4- or 6-Channel Audio Function.*

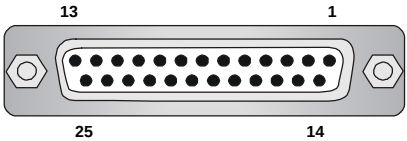


MSI Reminds You...

For advanced audio application, Realtek ALC655 audio chip is provided to offer support for ***6-channel audio operation*** *and can turn rear audio connectors from 2-channel to 4-/6-channel audio.*

Parallel Port Connector: LPT1

The mainboard provides a 25-pin female centronic connector as LPT. A parallel port is a standard printer port that supports Enhanced Parallel Port (EPP) and Extended Capabilities Parallel Port (ECP) mode.



Pin Definition

PIN	SIGNAL	DESCRIPTION
1	STROBE	Strobe
2	DATA0	Data0
3	DATA1	Data1
4	DATA2	Data2
5	DATA3	Data3
6	DATA4	Data4
7	DATA5	Data5
8	DATA6	Data6
9	DATA7	Data7
10	ACK#	Acknowledge
11	BUSY	Busy
12	PE	Paper End
13	SELECT	Select
14	AUTO FEED#	Automatic Feed
15	ERR#	Error
16	INIT#	Initialize Printer
17	SLIN#	Select In
18	GND	Ground
19	GND	Ground
20	GND	Ground
21	GND	Ground
22	GND	Ground
23	GND	Ground
24	GND	Ground
25	GND	Ground

Connectors

The mainboard provides connectors to connect to FDD, IDE HDD, case, modem, LAN, USB Ports, IR module and CPU/System/Power Supply FAN.

Floppy Disk Drive Connector: FDD1

The mainboard provides a standard floppy disk drive connector that supports 360K, 720K, 1.2M, 1.44M and 2.88M floppy disk types.

FDD1

IrDA Infrared Module Header: JIR1

The connector allows you to connect to IrDA Infrared module. You must configure the setting through the BIOS setup to use the IR function. JIR1 is compliant with Intel® Front Panel I/O Connectivity Design Guide.

Pin	Signal
1	NC
2	NC
3	VCC5
4	GND
5	IRTX
6	IRRX

Chassis Intrusion Switch Connector: JCASE1

This connector is connected to a 2-pin chassis switch. If the chassis is opened, the switch will be short. The system will record this status and show a warning message on the screen. To clear the warning, you must enter the BIOS utility and clear the record.

JCASE1

Fan Power Connectors: CFAN1/SFAN1/PWFAN1/PWFAN2

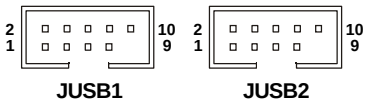
The CFAN1 (processor fan), SFAN1 (system fan), PWFAN1 (Power Supply fan) and PWFAN2 (Power Supply fan) support system cooling fan with +12V. It supports three-pin head connector. When connecting the wire to the connectors, always take note that the red wire is the positive and should be connected to the +12V, the black wire is Ground and should be connected to GND. This mainboard has a System Hardware Monitor chipset on-board, so that you must use a specially designed fan with speed sensor to take advantage of the CPU fan control.

MSI Reminds You...

1. *Always consult the vendors for proper CPU cooling fan.*
2. *CPUFAN1 supports the fan control.* ***You can install Core Center utility that will automatically control the CPU fan speed according to the actual CPU temperature.***

Front USB Connectors: JUSB1 / JUSB2

The mainboard provides two USB 2.0 pin headers *USB1* & *USB2* that are compliant with Intel® I/O Connectivity Design Guide. USB 2.0 technology increases data transfer rate up to a maximum throughput of 480Mbps, which is 40 times faster than USB 1.1, and is ideal for connecting high-speed USB interface peripherals such as **USB HDD**, **digital cameras**, **MP3 players**, **printers**, **modems and the like**.

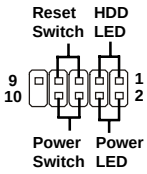


JUSB1 Pin Definition

PIN	SIGNAL	PIN	SIGNAL
1	VCC	2	VCC
3	USB0-	4	USB1-
5	USB0+	6	USB1+
7	GND	8	GND
9	Key	10	USBOC

Front Panel Connectors: JFP1 & JFP2

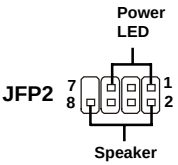
The mainboard provides two front panel connectors for electrical connection to the front panel switches and LEDs. JFP1 is compliant with Intel® Front Panel I/O Connectivity Design Guide.



JFP1

JFP1 Pin Definition

PIN	SIGNAL	DESCRIPTION
1	HD_LED_P	Hard disk LED pull-up
2	FP PWR/SLP	MSG LED pull-up
3	HD_LED_N	Hard disk active LED
4	FP PWR/SLP	MSG LED pull-up
5	RST_SW_N	Reset Switch low reference pull-down to GND
6	PWR_SW_P	Power Switch high reference pull-up
7	RST_SW_P	Reset Switch high reference pull-up
8	PWR_SW_N	Power Switch low reference pull-down to GND
9	RSVD_DNU	Reserved. Do not use.



JFP2 Pin Definition

PIN	SIGNAL	PIN	SIGNAL
1	GND	2	SPK-
3	SLED	4	BUZ+
5	PLED	6	BUZ-
7	NC	8	SPK+

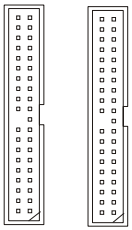
Power Saving Switch Connector: JGS1

Attach a power saving switch to this connector. Press the switch once to have the system entered the Sleep/Suspend state. Press any key to wake up the system.

JGS1

Hard Disk Connectors: IDE1 & IDE2

The mainboard has a 32-bit Enhanced PCI IDE and Ultra DMA 66/100/133 controller that provides PIO mode 0~5, Bus Master, and Ultra DMA 66/100/133 function. You can connect up to four hard disk drives, CD-ROM, 120MB Floppy (reserved for future BIOS) and other devices.



IDE1 (Primary IDE Connector)

The first hard drive should always be connected to IDE1. IDE1 can connect a Master and a Slave drive. You must configure second hard drive to Slave mode by setting the jumper accordingly.

IDE2 (Secondary IDE Connector)

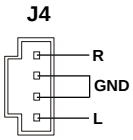
IDE2 can also connect a Master and a Slave drive.

MSI Reminds You...

If you install two hard disks on cable, you must configure the second drive to Slave mode by setting its jumper. Refer to the hard disk documentation supplied by hard disk vendors for jumper setting instructions.

CD-In Connector: J4

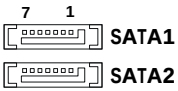
The connector is for CD-ROM audio connector.



Serial ATA/Serial ATA RAID Connectors controlled by VT8237: SATA1, SATA2

The Southbridge of this mainboard is VT8237 which supports two serial connectors SATA1 & SATA2.

SATA1 & SATA2 are dual high-speed Serial ATA interface ports. Each supports 1st generation serial ATA data rates of 150 MB/s. Both connectors are fully compliant with Serial ATA 1.0 specifications. Each Serial ATA connector can connect to 1 hard disk device. Please refer to *Serial ATA/Serial ATA Raid* manual for detail software installation procedure.

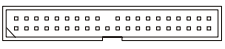


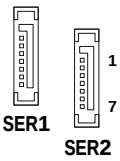
Serial ATA/Serial ATA RAID Connectors controlled by Promise 20378: IDE3, SER1 & SER2

The brand new Promise 20378 chipset supports one IDE connector IDE3 and two serial connectors SER1& SER2.

IDE3 is a 32-bit Enhanced PCI IDE and Ultra DMA 66/100/133 controller that provides PIO mode 0~6, Bus Master, and Ultra DMA 66/100/133 function. You can connect up to 2 hard disk drives---one IDE master and one IDE slave.

SER1 & SER2 are dual high-speed Serial ATA interface ports. Each supports 1st generation serial ATA data rates of 150 MB/s. Both connectors are fully compliant with Serial ATA 1.0 specifications. Each Serial ATA connector can connect to 1 hard disk device. Please refer to *Serial ATA/Serial ATA Raid* manual for detail software installation procedure.

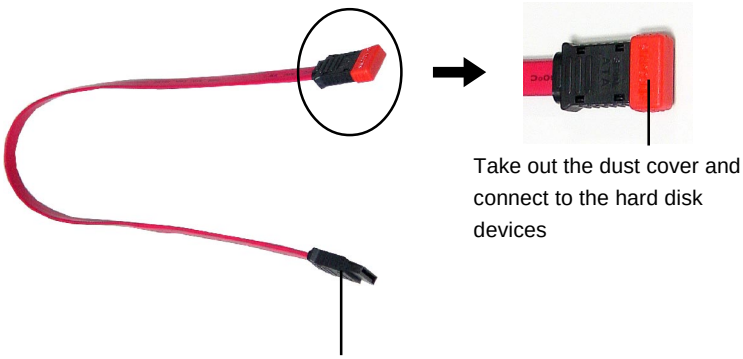




SER1 & SER2 Pin Definition

Pin	Signal	Pin	Signal
1	GND	2	TXP
3	TXN	4	GND
5	RXN	6	RXP
7	GND		

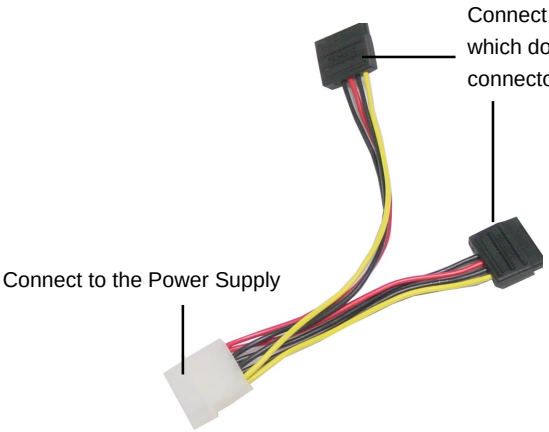
Optional Serial ATA cable



MSI Reminds You...

Please do not fold the serial ATA cable in a 90-degree angle, since this will cause the loss of data during the transmission.

Optional Power Cable



Front Panel Audio Connector: JAUD1

The JAUD1 front panel audio connector allows you to connect to the front panel audio and is compliant with Intel® Front Panel I/O Connectivity Design Guide.

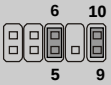
JAUD1

JAUD1 Pin Definition

PIN	SIGNAL	DESCRIPTION
1	AUD_MIC	Front panel microphone input signal
2	AUD_GND	Ground used by analog audio circuits
3	AUD_MIC_BIAS	Microphone power
4	AUD_VCC	Filtered +5V used by analog audio circuits
5	AUD_FPOUT_R	Right channel audio signal to front panel
6	AUD_RET_R	Right channel audio signal return from front panel
7	HP_ON	Reserved for future use to control headphone amplifier
8	KEY	No pin
9	AUD_FPOUT_L	Left channel audio signal to front panel
10	AUD_RET_L	Left channel audio signal return from front panel

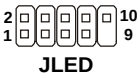
MSI Reminds You...

If you don't want to connect to the front audio header, pins 5 & 6, 9 & 10 have to be jumpered in order to have signal output directed to the rear audio ports. Otherwise, the Line-Out connector on the back panel will not function.



D-Bracket™ 2 Connector: JLED (Optional)

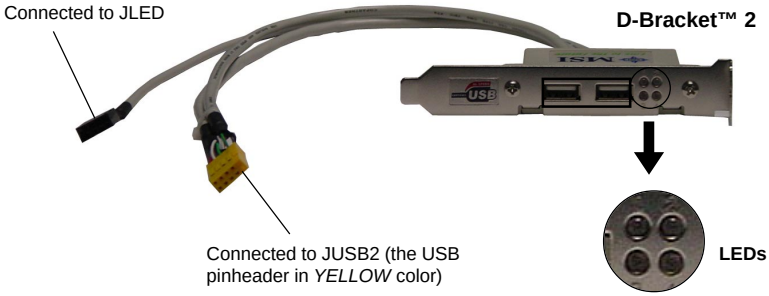
The mainboard comes with a JLED connector for you to connect to D-Bracket™ 2. D-Bracket™ 2 is a USB Bracket that supports both USB1.1 & 2. 0 spec. It integrates four LEDs and allows users to identify system problem through 16 various combinations of LED signals. For definitions of 16 signal combinations, please refer to *D-Bracket™ 2* in *Chapter 1*.



JLED

JLED Pin Definition

Pin	Signal
1	DBG1 (high for green color)
2	DBR1 (high for red color)
3	DBG2 (high for green color)
4	DBR2 (high for red color)
5	DBG3 (high for green color)
6	DBR3 (high for red color)
7	DBG4 (high for green color)
8	DBR4 (high for red color)
9	Key
10	NC

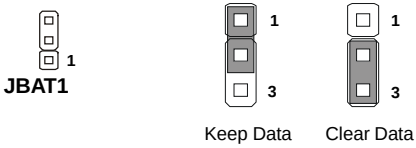


Jumpers

The motherboard provides the following jumpers for you to set the computer's function. This section will explain how to change your motherboard's function through the use of jumpers.

Clear CMOS Jumper: JBAT1

There is a CMOS RAM on board that has a power supply from external battery to keep the data of system configuration. With the CMOS RAM, the system can automatically boot OS every time it is turned on. If you want to clear the system configuration, use the JBAT1 (Clear CMOS Jumper) to clear data. Follow the instructions below to clear the data:

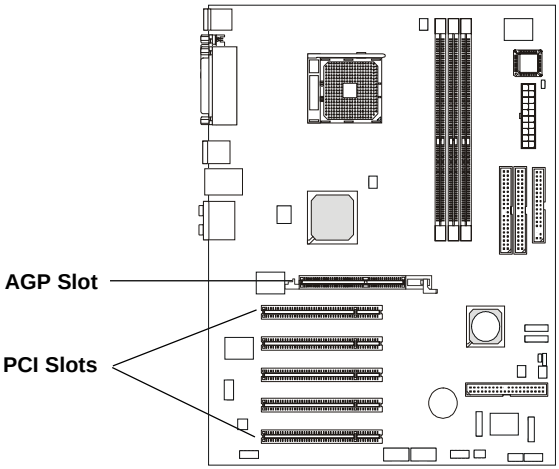


MSI Reminds You...

You can clear CMOS by shorting 2-3 pin while the system is off. Then return to 1-2 pin position. Avoid clearing the CMOS while the system is on; it will damage the mainboard.

Slots

The motherboard provides one AGP slot, and five 32-bit PCI bus slots.



AGP (Accelerated Graphics Port) Slot

The AGP slot allows you to insert the AGP graphics card. AGP is an interface specification designed for the throughput demands of 3D graphics. It introduces a 66MHz, 32-bit channel for the graphics controller to directly access main memory. The slot supports 8x/4x/2x/1x AGP card.

PCI (Peripheral Component Interconnect) Slots

The PCI slots allow you to insert the expansion cards to meet your needs. When adding or removing expansion cards, make sure that you unplug the power supply first. Meanwhile, read the documentation for the expansion card to make any necessary hardware or software settings for the expansion card, such as jumpers, switches or BIOS configuration.

PCI Interrupt Request Routing

The IRQ, acronym of interrupt request line and pronounced I-R-Q, are hardware lines over which devices can send interrupt signals to the microprocessor. The PCI IRQ pins are typically connected to the PCI bus INT A# ~ INT D# pins as follows:

	Order 1	Order 2	Order 3	Order 4
PCI Slot 1	INT A#	INT B#	INT C#	INT D#
PCI Slot 2	INT B#	INT C#	INT D#	INT A#
PCI Slot 3	INT C#	INT D#	INT A#	INT B#
PCI Slot 4	INT D#	INT A#	INT B#	INT C#
PCI Slot 5	INT B#	INT C#	INT D#	INT A#

BIOS Setup

This chapter provides information on the BIOS Setup program and allows you to configure the system for optimum use.

You may need to run the Setup program when:

◈ An error message appears on the screen during the system booting up, and requests you to run SETUP.

◈ You want to change the default settings for customized features.

Entering Setup

Power on the computer and the system will start POST (Power On Self Test) process. When the message below appears on the screen, press <DEL> key to enter Setup.

DEL:Setup F11:Boot Menu F12:Network boot TAB:Logo

If the message disappears before you respond and you still wish to enter Setup, restart the system by turning it OFF and On or pressing the RESET button. You may also restart the system by simultaneously pressing <Ctrl>, <Alt>, and <Delete> keys.

Selecting the First Boot Device

You are allowed to select the 1st boot device without entering the BIOS setup utility by pressing <F11>. When the same message as listed above appears on the screen, press <F11> to trigger the boot menu.

The POST messages might pass by too quickly for you to respond in time. If so, restart the system and press <F11> after around 2 or 3 seconds to activate the boot menu similar to the following.

Select First Boot Device		
Floppy	: 1st Floppy	
IDE-0	: IBM-DTLA-307038	
CDROM	: ATAPI CD-ROM DRIVE 40X M	
[Up / Dn] Select	[RETURN] Boot	[ESC] cancel

The boot menu will list all the bootable devices. Select the one you want to boot from by using arrow keys and then pressing <Enter>. The system will boot from the selected device. The selection will not make changes to the settings in the BIOS setup utility, so next time when you power on the system, it will still use the original first boot device to boot up.

Control Keys

<↑>	Move to the previous item
<↓>	Move to the next item
<←>	Move to the item in the left hand
<→>	Move to the item in the right hand
<Enter>	Select the item
<Esc>	Jumps to the Exit menu or returns to the main menu from a submenu
<+/PU>	Increase the numeric value or make changes
<-/PD>	Decrease the numeric value or make changes
<F7>	Load BIOS Setup Defaults
<F9>	Load High Performance Defaults
<F10>	Save all the CMOS changes and exit

Getting Help

After entering the Setup utility, the first screen you see is the Main Menu.

Main Menu

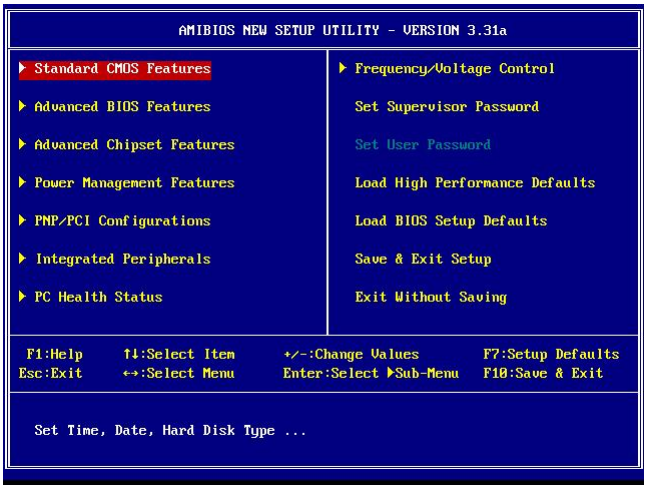
The main menu displays the setup categories the BIOS supplies. You can use the arrow keys (↑↓) to select the item. The on-line description for the selected setup category is displayed at the bottom of the screen.

Default Settings

The BIOS setup program contains two kinds of default settings: the BIOS Setup and High Performance defaults. BIOS Setup defaults provide stable performance settings for all devices and the system, while High Performance defaults provide the best system performance but may affect the system stability.

The Main Menu

Once you enter AMIBIOS NEW SETUP UTILITY, the Main Menu will appear on the screen. The Main Menu displays twelve configurable functions and two exit choices. Use arrow keys to move among the items and press <Enter> to enter the sub-menu.



Standard CMOS Features
Use this menu for basic system configurations, such as time, date etc.

Advanced BIOS Features
Use this menu to setup the items of AMI® special enhanced features.

Advanced Chipset Features
Use this menu to change the values in the chipset registers and optimize your system's performance.

Power Management Features
Use this menu to specify your settings for power management.

PNP/PCI Configurations
This entry appears if your system supports PnP/PCI.

Integrated Peripherals
Use this menu to specify your settings for integrated peripherals.

PC Health Status
This entry shows your PC health status.

Frequency/Voltage Control
Use this menu to specify your settings for frequency/voltage control.

Set Supervisor Password
Use this menu to set Supervisor Password.

Set User Password
Use this menu to set User Password.

Load High Performance Defaults
Use this menu to load the BIOS values for the best system performance, but the system stability may be affected.

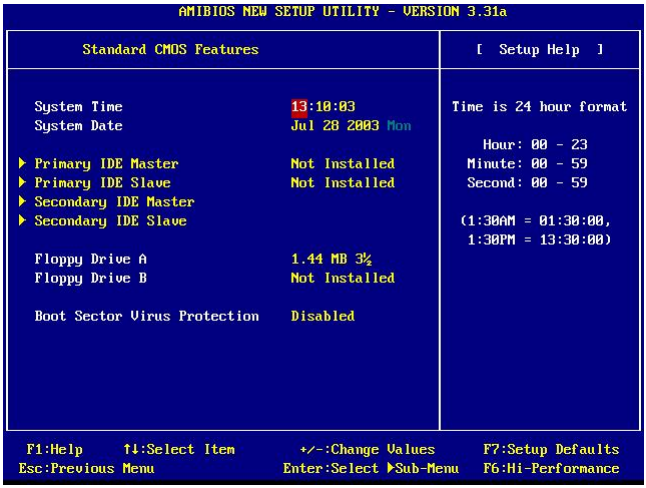
Load BIOS Setup Defaults
Use this menu to load factory default settings into the BIOS for stable system performance operations.

Save & Exit Setup
Save changes to CMOS and exit setup.

Exit Without Saving
Abandon all changes and exit setup.

Standard CMOS Features

The items inside STANDARD CMOS SETUP menu are divided into 9 categories. Each category includes none, one or more setup items. Use the arrow keys to highlight the item you want to modify and use the <PgUp> or <PgDn> keys to switch to the value you prefer.


AMIBIOS NEW SETUP UTILITY - VERSION 3.31a
Standard CMOS Features
[Setup Help]
System Time 13:10:03
System Date Jul 28 2003 Mon
Primary IDE Master Not Installed
Primary IDE Slave Not Installed
Secondary IDE Master
Secondary IDE Slave
Floppy Drive A 1.44 MB 3½
Floppy Drive B Not Installed
Boot Sector Virus Protection Disabled
Time is 24 hour format
Hour: 00 - 23
Minute: 00 - 59
Second: 00 - 59
(1:30AM = 01:30:00,
1:30PM = 13:30:00)
F1:Help ↑↓:Select Item +/-:Change Values F7:Setup Defaults
Esc:Previous Menu Enter:Select ▶Sub-Menu F6:Hi-Performance

System Time

This allows you to set the system time that you want (usually the current time). The time format is <hour> <minute> <second>.

System Date

This allows you to set the system to the date that you want (usually the current date). The format is <day><month> <date> <year>.

day	Day of the week, from Sun to Sat, determined by BIOS. Read-only.
month	The month from Jan. through Dec.
date	The date from 1 to 31 can be keyed by numeric function keys.
year	The year can be adjusted by users.

Primary/Secondary IDE Master/Slave

Press PgUp/<+> or PgDn/<-> to select the hard disk drive type. The specification of hard disk drive will show up on the right hand according to your selection.

Type	Select how to define the HDD parameters
Cylinders	Enter cylinder number
Heads	Enter head number
Write Precompensation	Enter write precomp cylinder
Sectors	Enter sector number
Maximum Capacity	Read the maximal HDD capacity
LBA Mode	Select *Auto* for a hard disk > 512 MB under Windows and DOS, or *Disabled* under Netware and UNIX
Block Mode	Select *Auto* to enhance the hard disk performance
Fast Programmed I/O Modes	Select Auto to enhance hard disk performance by optimizing the hard disk timing
32 Bit Transfer Mode	Enable 32 bit to maximize the IDE hard disk data transfer rate

Floppy Drive A:/B:

This item allows you to set the type of floppy drives installed. Available options: *Not Installed*, *1.2 MB 5¼*, *720 KB 3½*, *1.44 MB 3½* and *2.88 MB 3½*.

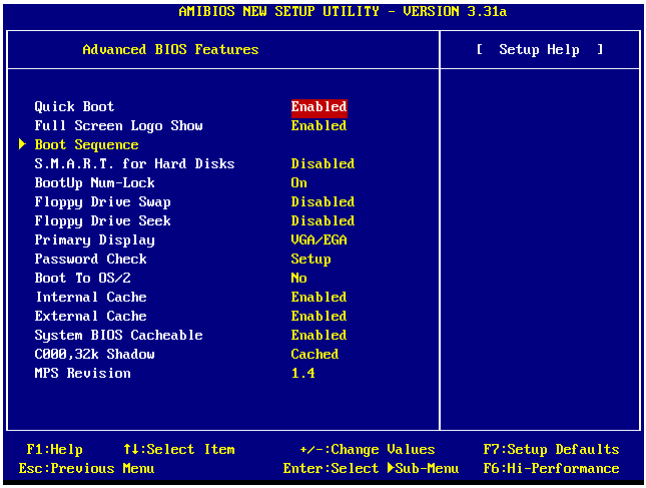
Boot Sector Virus Protection

The item is to set the Virus Warning feature for IDE Hard Disk boot sector protection. When *Enabled*, BIOS will issue a virus warning message and beep if a write to the boot sector or the partition table of the HDD is attempted. Setting options: *Disabled* and *Enabled*.

MSI Reminds You...

This feature only protects the boot sector, not the whole hard disk.

Advanced BIOS Features



Quick Boot

Setting the item to *Enabled* allows the system to boot within 5 seconds since it will skip some check items. Available options: *Enabled*, *Disabled*.

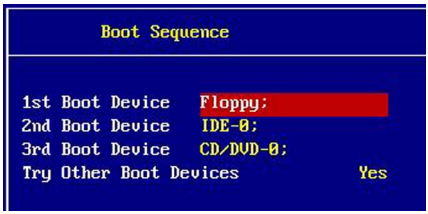
Full Screen LOGO Show

This item enables you to show the company logo on the bootup screen. Settings are:

Enabled	Shows a still image (logo) on the full screen at boot.
Disabled	Shows the POST messages at boot.

Boot Sequency

Press <Enter> to enter the sub-menu screen.



1st/2nd/3rd Boot Device
The items allow you to set the sequence of boot devices where AMIBIOS attempts to load the operating system.

S.M.A.R.T. for Hard Disks
This allows you to activate the S.M.A.R.T. (Self-Monitoring Analysis & Reporting Technology) capability for the hard disks. S.M.A.R.T is a utility that monitors your disk status to predict hard disk failure. This gives you an opportunity to move data from a hard disk that is going to fail to a safe place before the hard disk becomes offline. Settings: *Enabled*, *Disabled*.

BootUp Num-Lock
This item is to set the Num Lock status when the system is powered on. Setting to *On* will turn on the Num Lock key when the system is powered on. Setting to *Off* will allow end users to use the arrow keys on the numeric keypad. Setting options: *On, Off*.

Floppy Drive Swap
Setting to *Enabled* will swap floppy drives A: and B:.

Floppy Drive Seek
This setting causes the BIOS to search for floppy disk drives at boot time. When enabled, the BIOS will activate the floppy disk drives during the boot process: the drive activity light will come on and the head will move back and forth once. First A: will be done and then B: if it exists. Setting options: *Disabled*, *Enabled*.

Primary Display
This configures the primary subsystem in the computer. Available options: *Mono (monochrome)*, *CGA40x25*, *CGA80x25*, *VGA/EGA*, *Absent*.

Password Check
This specifies the type of AMIBIOS password protection that is implemented. Setting options are described below.

Option	Description
Setup	The password prompt appears only when end users try to run Setup.
Always	A password prompt appears every time when the computer is powered on or when end users try to run Setup.

Boot To OS/2
This allows you to run the OS/2® operating system with DRAM larger than 64MB. When you choose *No*, you cannot run the OS/2® operating system with DRAM larger than 64MB. But it is possible if you choose *Yes*.

Internal Cache
Cache memory is additional memory that is much faster than conventional DRAM (system memory). When the CPU requests data, the system transfers the requested data from the main DRAM into cache memory, for even faster access by the CPU. The setting controls the internal cache (also known as L1 or level 1 cache). Setting to *Enabled* will speed up the system performance.

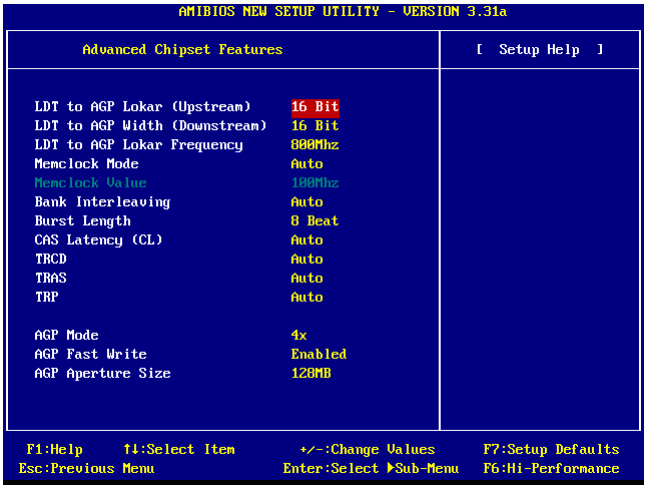
System BIOS Cacheable
Selecting *Enabled* allows caching of the system BIOS ROM at F0000h-FFFFFh, resulting in better system performance. However, if any program writes to this memory area, a system error may result. Setting options: *Enabled, Disabled*.

C000, 32k Shadow
This item specifies how the contents of the adapter ROM named in the item are handled. Settings are described below:

Option	Description
Disabled	The specified ROM is not copied to RAM.
Enabled	The contents of specified ROM are copied to RAM for faster system performance.
Cached	The contents of specified ROM are not only copied to RAM, the contents of the ROM area can be written to and read from cache memory.

MPS Table Version
This field allows you to select which MPS (Multi-Processor Specification) version to be used for the operating system. You need to select the MPS version supported by your operating system. To find out which version to use, consult the vendor of your operating system. Settings: *1.4*, *1.1*.

Advanced Chipset Features


AMIBIOS NEW SETUP UTILITY - VERSION 3.31a
Advanced Chipset Features
[Setup Help]
LDT to AGP Lokar (Upstream) 16 Bit
LDT to AGP Width (Downstream) 16 Bit
LDT to AGP Lokar Frequency 800Mhz
Memclock Mode Auto
Memclock Value 100Mhz
Bank Interleaving Auto
Burst Length 8 Beat
CAS Latency (CL) Auto
TRCD Auto
TRAS Auto
TRP Auto
AGP Mode 4x
AGP Fast Write Enabled
AGP Aperture Size 128MB
F1:Help ↑↓:Select Item +/-:Change Values F7:Setup Defaults
Esc:Previous Menu Enter:Select ▶Sub-Menu F6:Hi-Performance

MSI Reminds You...

Change these settings only if you are familiar with the chipset.

LDT to AGP Lokar (Upstream) / LDT to AGP Width (Downstream)

These two item control the utilized widths of the HyperTransport link. Setting options: *8 bit, 16 bit.*

LDT to AGP Lokar Frequency

This item specifies the maximum operating frequency of the link's transmitter clock. Setting options: *Auto, 800 MHz, 600 MHz, 400 MHz, 200 MHz.*

Memclock Mode / Memclock Value

When it is set to *Manual* in "Memclock Mode", user can place an artificial memory clock limit on the system. Please note that memory is prevented from running faster than this frequency. Setting options: *DDR200, DDR266, DDR300, DDR333, DDR400.*

Bank Interleaving
This field selects 2-bank or 4-bank interleave for the installed SDRAM. Disable the function if 16MB SDRAM is installed. Settings: *Disabled*, *2-Way* and *4-Way*.

Burst Length
This setting allows you to set the size of Burst-Length for DRAM. Bursting feature is a technique that DRAM itself predicts the address of the next memory location to be accessed after the first address is accessed. To use the feature, you need to define the burst length, which is the actual length of burst plus the starting address and allows internal address counter to properly generate the next memory location. The bigger the size, the faster the DRAM performance. Settings: *4 QW* and *8 QW*.

CAS Latency (CL)
This controls the timing delay (in clock cycles) before SDRAM starts a read command after receiving it. Settings: *2*, *2.5*, *3* (clocks). *2* (clocks) increases the system performance the most while *3* (clocks) provides the most stable performance.

TRCD
When DRAM is refreshed, both rows and columns are addressed separately. This setup item allows you to determine the timing of the transition from RAS (row address strobe) to CAS (column address strobe). The less the clock cycles, the faster the DRAM performance. Settings: *2T* to *5T*.

TRAS
This setting determines the time RAS takes to read from and write to a memory cell. Setting options: *4T* to *9T*.

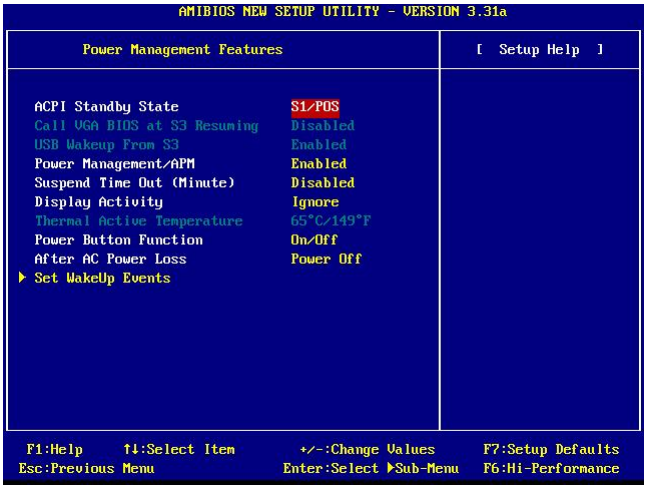
TRP
This setting controls the number of cycles for Row Address Strobe (RAS) to be allowed to precharge. If insufficient time is allowed for the RAS to accumulate its charge before DRAM refresh, refresh may be incomplete and DRAM may fail to retain data. This item applies only when synchronous DRAM is installed in the system. Setting options: *2T* to *5T*.

AGP Mode
The item sets an appropriate mode for the installed AGP card. Setting options: *1x, 2x, 4x, Auto*. Select *4x* only if your AGP card supports it.

AGP Fast Write
This option enables or disables the AGP Fast Write feature. The Fast Write technology allows the CPU to write directly to the graphics card without passing anything through the system memory and improves the AGP 4X speed. Select *Enabled* only when the installed AGP card supports this function. Settings: *Enabled, Disabled.*

AGP Aperture Size
This setting controls just how much system RAM can be allocated to AGP for video purposes. The aperture is a portion of the PCI memory address range dedicated to graphics memory address space. Host cycles that hit the aperture range are forwarded to the AGP without any translation. The option allows the selection of an aperture size of *4MB, 8MB, 16MB, 32MB, 64MB, 128MB, and 256 MB.*

Power Management Features


AMIBIOS NEW SETUP UTILITY - VERSION 3.31a
Power Management Features
[Setup Help]
ACPI Standby State S1/POS
Call VGA BIOS at S3 Resuming Disabled
USB Wakeup From S3 Enabled
Power Management/APM Enabled
Suspend Time Out (Minute) Disabled
Display Activity Ignore
Thermal Active Temperature 65°C/149°F
Power Button Function On/Off
After AC Power Loss Power Off
Set WakeUp Events
F1:Help ↑↓:Select Item +/-:Change Values F7:Setup Defaults
Esc:Previous Menu Enter:Select ▶Sub-Menu F6:Hi-Performance

MSI Reminds You...

S3-related functions described in this section are available only when your BIOS supports S3 sleep mode.

ACPI Standby State

This item specifies the power saving modes for ACPI function. If your operating system supports ACPI, such as Windows 98SE, Windows ME and Windows 2000, you can choose to enter the Standby mode in S1(POS) or S3 (STR) fashion through the setting of this field. Options are:

S1/POS The S1 sleep mode is a low power state. In this state, no system context is lost (CPU or chipset) and hardware maintains all system context.

S3/STR The S3 sleep mode is a lower power state where the information of system configuration and open applications/ files is saved to main memory that remains powered while most other hardware components turn off to save energy. The information stored in memory will be used to restore the system when a “wake up” event occurs.

Auto BIOS determines the best ode automatically.

Call VGA BIOS at S3 Resuming
Selecting *Enabled* allows BIOS to call VGA BIOS to initialize the VGA card when system wakes up (resumes) from S3 sleep state. The system resume time is shortened when you disable the function, but system will need an AGP driver to initialize the VGA card. Therefore, if the AGP driver of the card does not support the initialization feature, the display may work abnormally or not function after resuming from S3.

USB Device Wakeup From S3
This item allows the activity of the USB device to wake up the system from S3 (Suspend to RAM) sleep state. Settings: *Enabled, Disabled*.

Power Management/APM
Setting to *Enabled* will activate an Advanced Power Management (APM) device to enhance Max Saving mode and stop CPU internal clock. Settings: *Disabled, Enabled.*

Suspend Time Out (Minute)
After the selected period of system inactivity, all devices except the CPU shut off. Settings: *Disabled, 1, 2, 4, 8, 10, 20, 30, 40, 50, 60.*

Display Activity
These items specify if the BIOS will monitor the activity of the specified hardware peripheral or component. If set to *Monitor*, any activity detected on the specified hardware peripheral or component will wake up the system or prevent the system from entering the power saving modes. Settings: *Monitor, Ignore.*

Thermal Active Temperature
If the CPU temperature reaches the upper limit preset in this setting, the warning mechanism will be activated. This helps you to prevent the CPU overheating problem.

Power Button Function
This feature sets the function of the power button. Settings are:

On/Off	The power button functions as normal power off button.
Suspend	When you press the power button, the computer enters

the suspend/sleep mode, but if the button is pressed for more than four seconds, the computer is turned off.

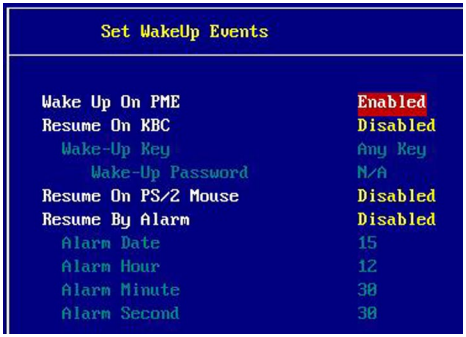
After AC Power Loss

This setting specifies whether your system will reboot after a power failure or interrupt occurs. Available settings are:

Power Off	Leaves the computer in the power off state.
Power On	Reboots the computer.
Last State	Restores the system to the previous status before power failure or interrupt occurred.

Set WakeUp Events

Press <Enter> and the following sub-menu appears.



Wake Up On PME, Resume On KBC (with "Wake-Up Key" and "Wake-Up Password"), Resume On PS/2 Mouse

These fields specify whether the system will be awakened from power saving modes when activity or input signal of the specified hardware peripheral or component is detected. Settings: *Enabled*, *Disabled.*

MSI Reminds You...

For "Wake-Up Key" function, the option "Specific Key" refers to the password you specify in the "Wake-Up Password" field. Once you set up a password, it will disable "Resume on PS/2 Mouse".

Resume By Alarm

This is used to enable or disable the feature of booting up the system on a scheduled time/date from the soft off (S5) state. Settings: *Enabled*, *Disabled*.

Alarm Date/Hour/Minute/Second

If *Resume By Alarm* is set to *Enabled*, the system will automatically resume (boot up) on a specific date/hour/minute/second specified in these fields. Available settings for each item are:

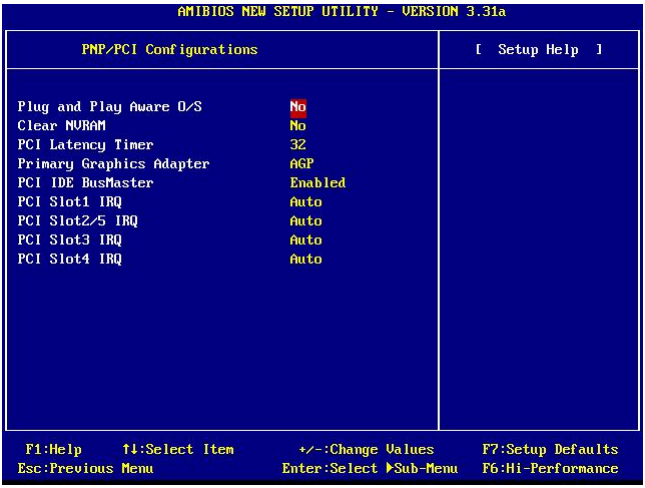
Alarm Date	*01 ~ 31, Every Day*
Alarm Hour	*00 ~ 23*
Alarm Minute	*00 ~ 59*
Alarm Second	*00 ~ 59*

MSI Reminds You...

If you have changed this setting, you must let the system boot up until it enters the operating system, before this function will work.

PNP/PCI Configurations

This section describes configuring the PCI bus system and PnP (Plug & Play) feature. PCI, or **P**eripheral **C**omponent **I**nterconnect, is a system which allows I/O devices to operate at speeds nearing the speed the CPU itself uses when communicating with its special components. This section covers some very technical items and it is strongly recommended that only experienced users should make any changes to the default settings.


AMIBIOS NEW SETUP UTILITY - VERSION 3.31a
PNP/PCI Configurations
[Setup Help]
Plug and Play Aware O/S No
Clear NVRAM No
PCI Latency Timer 32
Primary Graphics Adapter AGP
PCI IDE BusMaster Enabled
PCI Slot1 IRQ Auto
PCI Slot2/5 IRQ Auto
PCI Slot3 IRQ Auto
PCI Slot4 IRQ Auto
F1:Help ↑↓:Select Item +/-:Change Values F7:Setup Defaults
Esc:Previous Menu Enter:Select ▶Sub-Menu F6:Hi-Performance

Plug and Play Aware O/S

When set to *Yes*, BIOS will only initialize the PnP cards used for booting (VGA, IDE, SCSI). The rest of the cards will be initialized by the PnP operating system like Windows® 98, 2000 or ME. When set to *No*, BIOS will initialize all the PnP cards. Select *Yes* if the operating system is Plug & Play.

Clear NVRAM

The ESCD (Extended System Configuration Data) NVRAM (Non-volatile Random Access Memory) is where the BIOS stores resource information for both PNP and non-PNP devices in a bit string format. When the item is set to *Yes*, the system will reset ESCD NVRAM right after the system is booted up and then set the setting of the item back to *No* automatically.

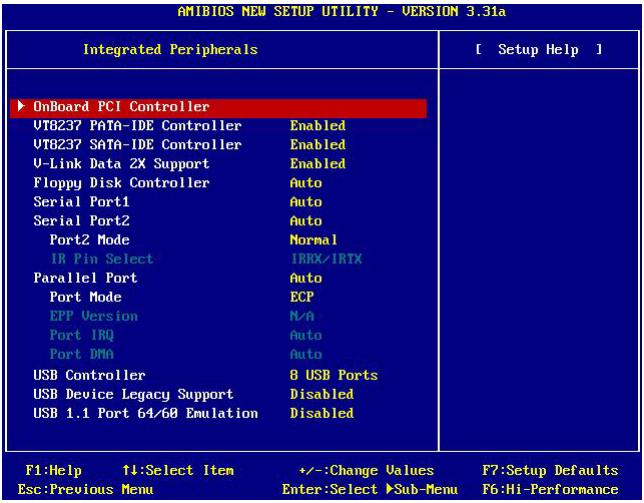
PCI Latency Timer
This item controls how long each PCI device can hold the bus before another takes over. When set to higher values, every PCI device can conduct transactions for a longer time and thus improve the effective PCI bandwidth. For better PCI performance, you should set the item to higher values. Settings range from *32* to *248* at a 32 increment.

Primary Graphics Adaptor
This setting specifies which VGA card is your primary graphics adapter. Setting options: *PCI, AGP*.

Primary IDE BusMaster
Set this option to *Enabled* to specify that the IDE controller on the PCI local bus has bus mastering capability. Settings options: *Disabled, Enabled.*

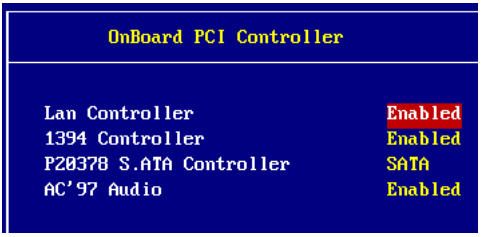
PCI Slot1 IRQ, PCI Slot2/5 IRQ, PCI Slot3 IRQ, PCI Slot4/6 IRQ
These items specify the IRQ line for each PCI slot. Setting options: *3, 4, 5, 7, 9, 10, 11, Auto*. Selecting *Auto* allows BIOS to automatically determine the IRQ line for each PCI slot.

Integrated Peripherals


AMIBIOS NEW SETUP UTILITY - VERSION 3.31a
Integrated Peripherals
[Setup Help]
OnBoard PCI Controller
VT8237 PATA-IDE Controller Enabled
VT8237 SATA-IDE Controller Enabled
V-Link Data 2X Support Enabled
Floppy Disk Controller Auto
Serial Port1 Auto
Serial Port2 Auto
Port2 Mode Normal
IR Pin Select IRRX/IRTX
Parallel Port Auto
Port Mode ECP
EPP Version N/A
Port IRQ Auto
Port DMA Auto
USB Controller 8 USB Ports
USB Device Legacy Support Disabled
USB 1.1 Port 64/60 Emulation Disabled
F1:Help ↑↓:Select Item +/-:Change Values F2:Setup Defaults
Esc:Previous Menu Enter:Select ▶Sub-Menu F6:Hi-Performance

OnBoard PCI Controller

Press <Enter> to enter the sub-menu screen.



LAN Controller, P20378 S.ATA Controller, 1394 Controller, Audio Controller

Set these options to *Enabled* (SATA or RAID for P20378 S.ATA Controller) to enable the controllers of these four PCI devices.

VT8237 PATA-IDE Controller

This setting is used to enable/disabled the VT8237 PATA-IDE controller. Setting options: *Enabled, Disabled.*

VT8237 SATA-IDE Controller
This setting is used to enable/disabled the VT8237 SATA-IDE controller. Setting options: *Disabled, Enabled.*

V-Link Data 2X Support
This setting controls the onboard V-Link Data 2X Support. Setting options: *Enabled, Disabled.*

Floopy Disk Controller
This is used to enable or disable the onboard Floppy controller.

Option	Description
Auto	BIOS will automatically determine whether to enable the onboard Floppy controller or not.
Enabled	Enables the onboard Floppy controller.
Disabled	Disables the onboard Floppy controller.

Serial Port 1/2
These items specify the base I/O port addresses of the onboard Serial Port 1 (COM A)/Serial Port 2 (COM B). Selecting *Auto* allows AMIBIOS to automatically determine the correct base I/O port address. Settings: *Auto, 3F8/COM1, 2F8/COM2, 3E8/COM3, 2E8/COM4* and *Disabled*.

Port2 Mode
This item sets the operation mode for Serial Port 2. Settings: *Normal, 1.6 uS, 3/16 Baud* and *ASKIR* (the last three operation modes are setting options for IR function).

IR Pin Select
Set to *IRRX/IRTX* when using an internal IR module connected to the IR header. Set to *SINB/SOUTB.* when connecting an IR adapter to COM B.

Parallel Port
This field specifies the base I/O port address of the onboard parallel port. Selecting *Auto* allows AMIBIOS to automatically determine the correct base I/O port address. Settings: *Auto, 378, 278, Disabled*.

Port Mode
This item selects the operation mode for the onboard parallel port: *ECP*, *Normal*, *Bi-Dir* or *EPP*.

EPP Version
The item selects the EPP version used by the parallel port if the port is set to *EPP* mode. Settings: *1.7, 1.9.*

Port IRQ
When *OnBoard Parallel Port* is set to *Auto*, the item shows *Auto* indicating that BIOS determines the IRQ for the parallel port automatically.

Port DMA
This feature needs to be configured only when *Parallel Port Mode* is set to the *ECP* mode. When Parallel Port is set to *Auto*, the field will show *Auto* indicating that BIOS automatically determines the DMA channel for the parallel port.

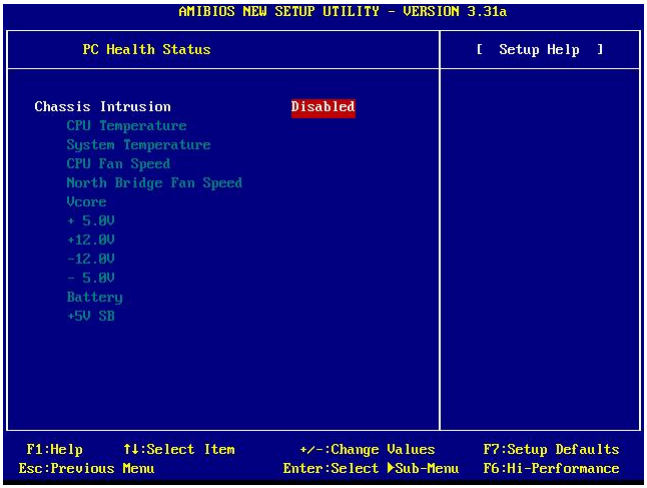
USB Controller
This setting is used to enable/disable the onboard USB ports. Setting options: *Disabled, 2 USB Ports, 4 USB Ports, 6 USB Ports*

USB Device Legacy Support
Set to *All Device* if you need to use any USB device in the operating system that does not support or have any USB driver installed, such as DOS and SCO Unix. Set to *No Mice* only if you want to use any USB device other than the USB mouse.

USB 1.1 Port 64/60 Emulation
This field controls the USB Port 64/60 Emulation function. When the function is enabled, the USB keyboard is allowed to type some special combination keys. Setting options: *Disabled, Enabled.*

PC Health Status

This section shows the status of your CPU, fan, overall system status, etc. Monitor function is available only if there is hardware monitoring mechanism onboard.



Chassis Intrusion

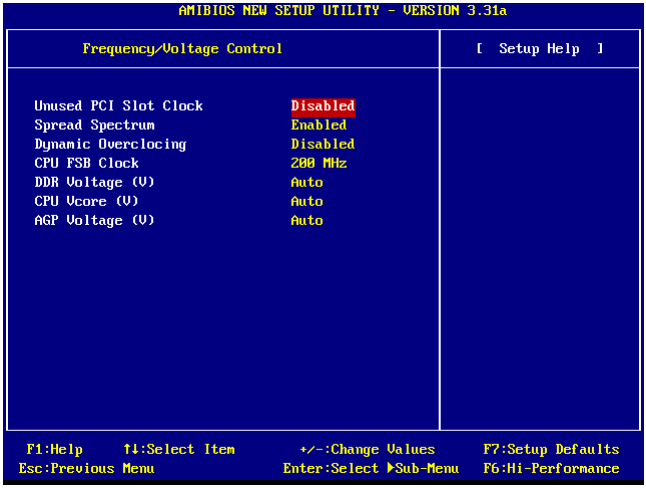
The field enables or disables the feature of recording the chassis intrusion status and issuing a warning message if the chassis is once opened. To clear the warning message, set the field to *Reset*. The setting of the field will automatically return to *Enabled* later. Settings: *Enabled*, *Reset*, *Disabled*.

CPU/System Temperature, CPU/System Fan Speed, Vcore, +5.0V, +12.0V, -12.0V, -5.0V, Battery, +5V SB

These items display the current status of all of the monitored hardware devices/components such as CPU voltages, temperatures and all fans' speeds.

Frequency/Voltage Control

Use this menu to specify your settings for frequency/voltage control.


AMIBIOS NEW SETUP UTILITY - VERSION 3.31a
Frequency/Voltage Control
[Setup Help]
Unused PCI Slot Clock Disabled
Spread Spectrum Enabled
Dynamic Overclocing Disabled
CPU FSB Clock 200 MHz
DDR Voltage (V) Auto
CPU Vcore (V) Auto
AGP Voltage (V) Auto
F1:Help ↑↓:Select Item +/-:Change Values F7:Setup Defaults
Esc:Previous Menu Enter:Select ▶Sub-Menu F6:Hi-Performance

Unused PCI Slot Clock

This item enables or disables the PCI slot clock. Setting options: *Disabled, Enabled.*

Spread Spectrum

When the motherboard's clock generator pulses, the extreme values (spikes) of the pulses creates EMI (Electromagnetic Interference). The Spread Spectrum function reduces the EMI generated by modulating the pulses so that the spikes of the pulses are reduced to flatter curves. If you do not have any EMI problem, leave the setting at *Disabled* for optimal system stability and performance. But if you are plagued by EMI, setting to *Enabled* for EMI reduction. Remember to disable Spread Spectrum if you are overclocking because even a slight jitter can introduce a temporary boost in clockspeed which may just cause your overclocked processor to lock up.

Dynamic OverClocking

Dynamic Overclocking Technology is the automatic overclocking function, included in the MSI™'s newly developed CoreCell™ Technology. It is designed to detect the load balance of CPU while running programs, and to adjust the

best CPU frequency automatically. When the motherboard detects CPU is running programs, it will speed up CPU automatically to make the program run smoothly and faster. When the CPU is temporarily suspending or staying in the low load balance, it will restore the default settings instead. Usually the Dynamic Overclocking Technology will be powered only when users' PC need to run huge amount of data like 3D games or the video process, and the CPU frequency need to be boosted up to enhance the overall performance. Setting options:

Disabled	Disable Dynamic Overclocking.
Private	1st level of overclocking.
Sergeant	2nd level of overclocking.
Captain	3rd level of overclocking, also the default value of "Load High Performance Defaults".
Colonel	4th level of overclocking.
General	5th level of overclocking.
Commander	6th level of overclocking.

MSI Reminds You...

Even though the Dynamic Overclocking Technology is more stable than manual overclocking, basically, it is still risky. We suggest user to make sure that your CPU can afford to overclocking regularly first. If you find the PC appears to be unstable or reboot incidentally, it's better to disable the Dynamic Overclocking or to lower the level of overclocking options. By the way, if you need to conduct overclocking manually, you also need to disable the Dynamic OverClocking first.

CPU FSB Clock

This item allows you to select the CPU Front Side Bus clock frequency (in MHz) and overclock the processor by adjusting the FSB clock to a higher frequency. Select the number between *100~280* for needed frequency.

DDR Voltage (V)

Adjusting the DDR voltage can increase the DDR speed. Any changes made to this setting may cause a stability issue, so ***changing the DDR voltage for long-term purpose is NOT recommended***.

CPU Vcore (V)

The settings are used to adjust the CPU clock multiplier (ratio) and CPU corevoltage (Vcore). These settings offer users a tool to overclock the system.

MSI Reminds You...

Changing CPU Ratio/Vcore could result in the instability of the system; therefore, it is NOT recommended to change the default setting for long-term usage.

AGP Voltage (V)

AGP voltage is adjustable in the field, allowing you to increase the performance of your AGP display card when overclocking, but the stability may be affected. Setting options: *Auto, 1.6, 1.7, 1.8.*

Set Supervisor/User Password

When you select this function, a message as below will appear on the screen:

Type the password, up to six characters in length, and press <Enter>. The password typed now will replace any previously set password from CMOS memory. You will be prompted to confirm the password. Retype the password and press <Enter>. You may also press <Esc> to abort the selection and not enter a password.

To clear a set password, just press <Enter> when you are prompted to enter the password. A message will show up confirming the password will be disabled. Once the password is disabled, the system will boot and you can enter Setup without entering any password.

When a password has been set, you will be prompted to enter it every time you try to enter Setup. This prevents an unauthorized person from changing any part of your system configuration.

Additionally, when a password is enabled, you can also have AMIBIOS to request a password each time the system is booted. This would prevent unauthorized use of your computer. The setting to determine when the password prompt is required is the PASSWORD CHECK option of the ADVANCED BIOS FEATURES menu. If the PASSWORD CHECK option is set to *Always*, the password is required both at boot and at entry to Setup. If set to *Setup*, password prompt only occurs when you try to enter Setup.

MSI Reminds You...

About Supervisor Password & User Password:

Supervisor password:	*Can enter and change the settings of the setup menu.*
User password:	*Can only enter but do not have the right to change the settings of the setup menu.*

Load High Performance/BIOS Setup Defaults

The two options on the main menu allow users to restore all of the BIOS settings to High Performance defaults or BIOS Setup defaults. The High Performance Defaults are the values set by the mainboard manufacturer for the best system performance but probably will cause a stability issue. The BIOS Setup Defaults are the default values also set by the mainboard manufacturer for stable performance of the mainboard.

When you select Load High Performance Defaults, a message as below appears:

[Load High Performance Defaults]
WARNING! This default might have potential reliability risk.
Press [Enter] to Continue
Or [ESC] to Abort

Pressing 'Enter' loads the default BIOS values that enable the best system performance but may lead to a stability issue.

MSI Reminds You...

The option is for power or overclocking users only*. Use of high performance defaults will tighten most timings to increase the system performance. Therefore, a high-end system configuration is a must, which means you need high-quality VGA adapter, RAM and so on.* ***We don't recommend that users should apply the high performance defaults in their regular systems.*** *Otherwise, the system may become unstable or even crash. If the system crashes or hangs after enabling the feature, please CLEAR CMOS DATA to resolve the problem. For more information, refer to "Clear CMOS Jumper:JBAT1" in Chapter 2.*

When you select Load BIOS Setup Defaults, a message as below appears:

Pressing 'Enter' loads the default values that are factory settings for stable system performance.

Appendix A: Using 4- or 6-Channel Audio Function

The mainboard is equipped with Realtek ALC655 chip, which provides support for 6-channel audio output, including 2 Front, 2 Rear, 1 Center and 1 Subwoofer channel. ALC655 allows the board to attach 4 or 6 speakers for better surround sound effect. The section will tell you how to install and use 4-/6-channel audio function on the board.

Installing the Audio Driver

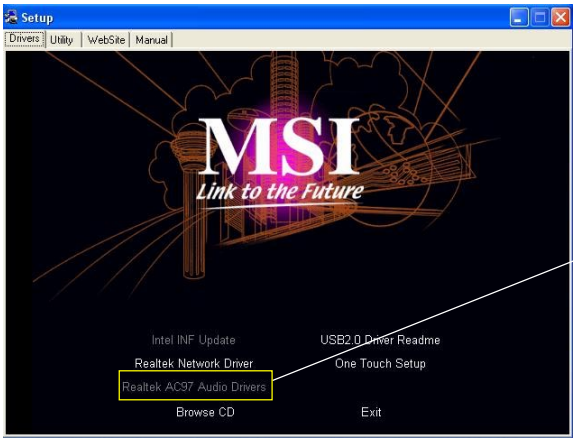
You need to install the driver for Realtek ALC655 chip to function properly before you can get access to 4-/6-channel audio operations. Follow the procedures described below to install the drivers for different operating systems.

Installation for Windows 98SE/ME/2000/XP

For Windows® 2000, you must install Windows® 2000 Service Pack2 or later before installing the driver.

The following illustrations are based on Windows® XP environment and could look slightly different if you install the drivers in different operating systems.

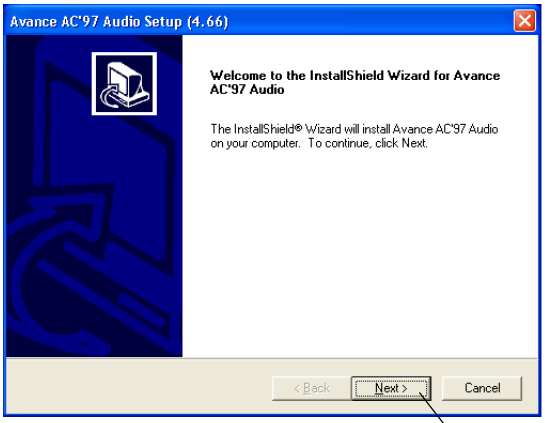
1. Insert the companion CD into the CD-ROM drive. The setup screen will automatically appear.
2. Click **Realtek AC97 Audio Driver**.



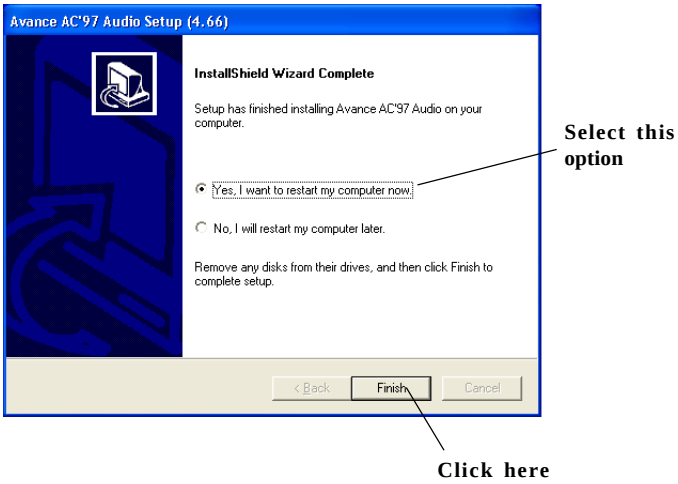
MSI Reminds You...

*The **AC97 Audio Configuration** software utility is under continuous update to enhance audio applications. Hence, the program screens shown here in this appendix may be slightly different from the latest software utility and shall be held for reference only.*

3. Click **Next** to install the AC'97 Audio software.


Avance AC'97 Audio Setup (4.66)
Welcome to the InstallShield Wizard for Avance AC'97 Audio
The InstallShield® Wizard will install Avance AC'97 Audio on your computer. To continue, click Next.
< Back
Next >
Cancel
Click here

4. Click **Finish** to restart the system.

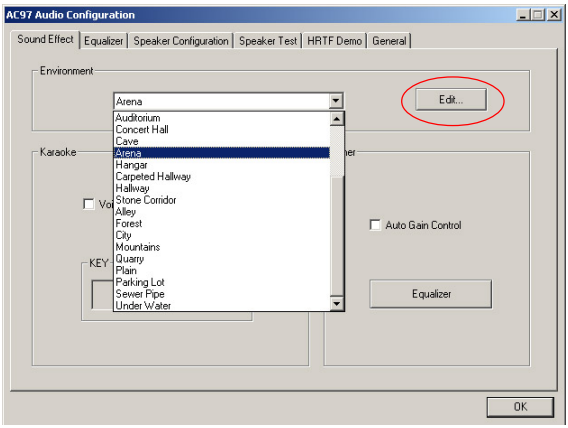

Avance AC'97 Audio Setup (4.66)
InstallShield Wizard Complete
Setup has finished installing Avance AC'97 Audio on your computer.
Yes, I want to restart my computer now.
No, I will restart my computer later.
Remove any disks from their drives, and then click Finish to complete setup.
< Back
Finish
Cancel
Select this option
Click here

Software Configuration

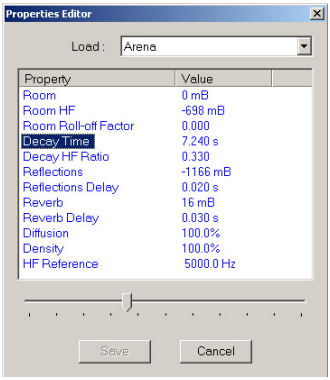
After installing the audio driver, you are able to use the 4-/6-channel audio feature now. Click the audio icon from the window tray at the lower-right corner of the screen to activate the **AC97 Audio Configuration**.

Sound Effect

Here you can select a sound effect you like from the **Environment** list.

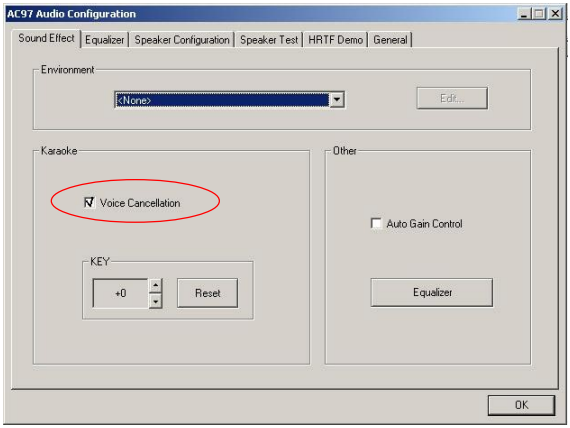


You may also edit the properties for an environment as you wish by clicking the **Edit** button, then just scroll the bar in the bottom for each property to adjust.



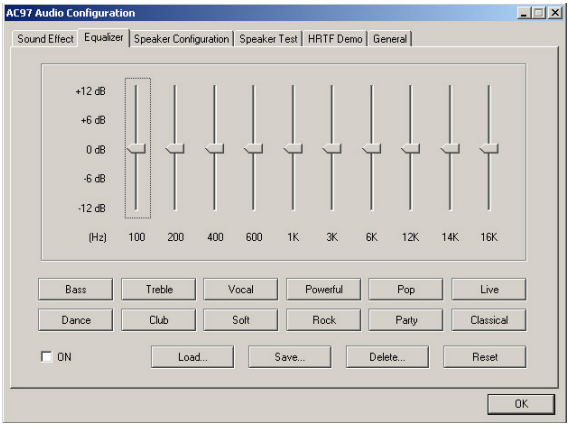
Here it provides the Karaoke function which will automatically remove human voice (lyrics) and leave melody for you to sing the song. Note that this function applies only for 2-channel audio operation.

Just check the **Voice Cancellation** box and then click **OK** to activate the Karaoke function.

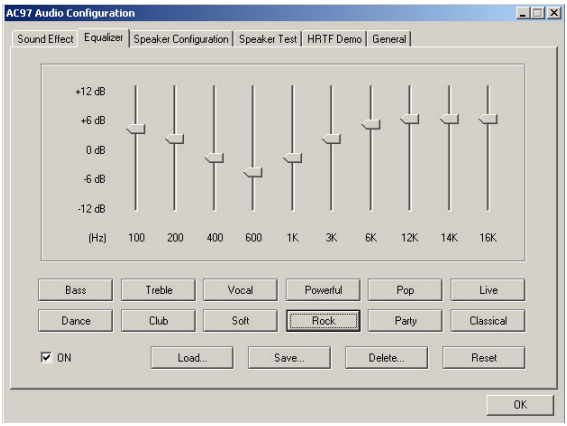


Equalizer

Here you regulate each equalizer for current playing digital sound sources.



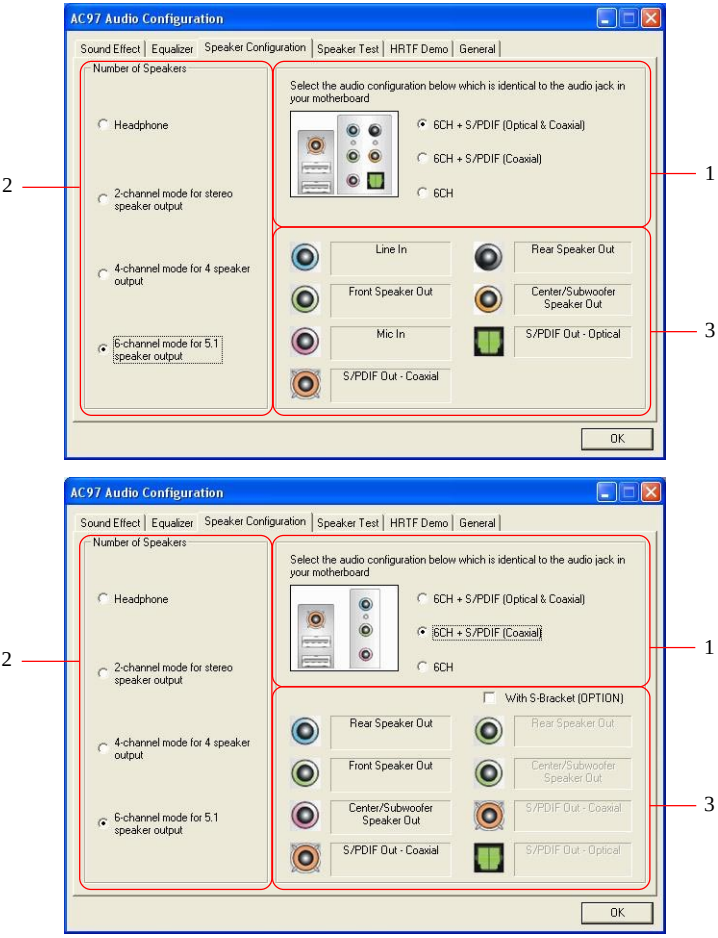
You may choose the provided sound effects, and the equalizer will adjust automatically. If you like, you may also load an equalizer setting or make an new equalizer setting to save as an new one by using the buttons **Load** and **Save**. Or you may click **Reset** to use the default value.



Speaker Configuration

In this tab, you can easily configure your multi-channel audio function and speakers.

1. Select the audio configuration below which is identical to the audio jack in your mainboard. For this K8T Neo mainboard, you will have to choose **6CH + S/PDIF (Optical & Coaxial)** or **6CH + S/PDIF (Coaxial)**.



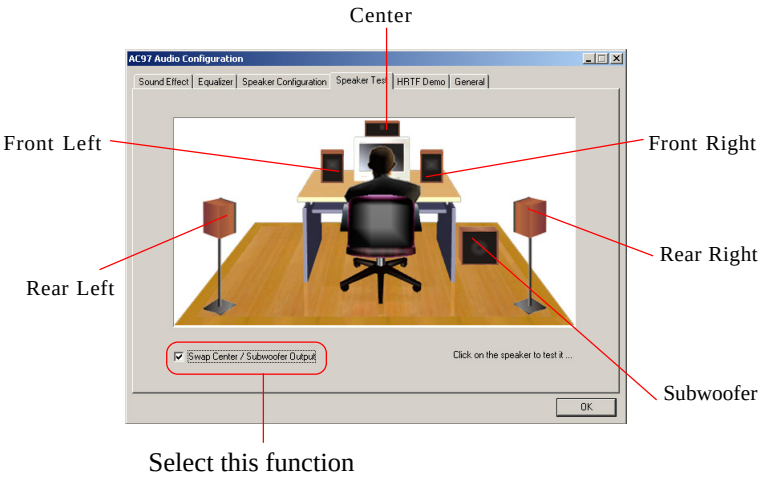
2. Select a desired multi-channel operation from ***Number of Speaker***.
   a. Headphone for the common headphone
   b. 2-Channel Mode for Stereo-Speaker Output
   c. 4-Channel Mode for 4-Speaker Output
   d. 6-Channel Mode for 5.1-Speaker Output

3. Here it shows the multi-channel setting for the audio jack. Please connect your speakers to the correct phone jack in accordance with the setting displayed here.

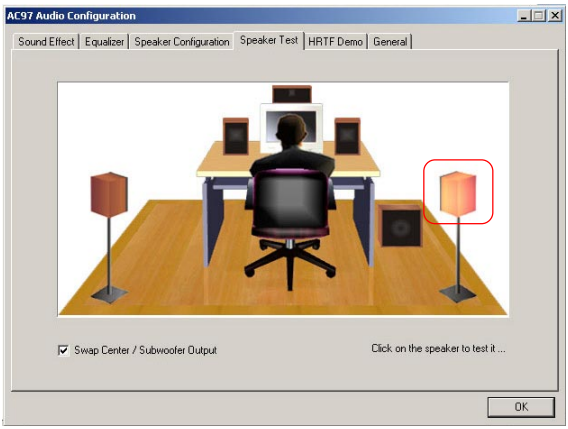
4. Then click **OK** to apply the configuration.

Speaker Test

You can use this tab to test each connected speaker to ensure if 4- or 6-channel audio operation works properly. If any speaker fails to make sound, then check whether the cable is inserted firmly to the connector or replace the bad speakers with good ones.



Select the speaker by clicking it to test its functionality. The one you select will light up and make testing sound.

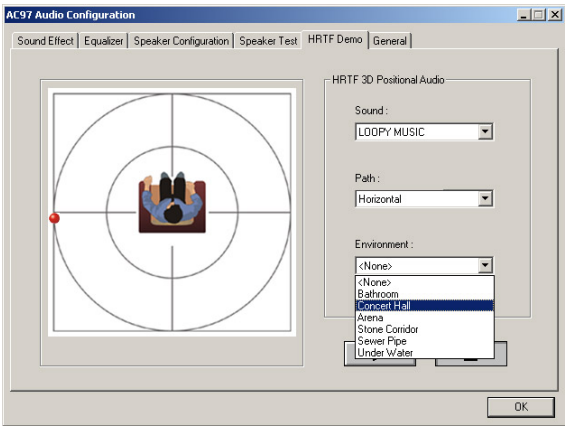


MSI Reminds You...

1. *6 speakers appear on the "Speaker Test" tab only when you select "**6-Channel Mode**" in the "Number of Speakers" column in "Speaker Configuration" tab. If you select "4-Channel Mode", only 4 speakers appear on the window.*
2. *While you are testing the speakers in 6-Channel Mode, if the sound coming from the center speaker and subwoofer is swapped, you should select **Swap Center/Subwoofer Output** to readjust these two channels.*

HRTF Demo

In this tab you may adjust your HRTF (Head Related Transfer Functions) 3D positional audio before playing 3D audio applications like gaming. You may also select different environment to choose the most suitable environment you like.



General

In this tab it provides some information about this AC97 Audio Configuration utility, including Audio Driver Version, DirectX Version, Audio Controller & AC97 Codec. You may also select the language of this utility by choosing from the **Language** list.